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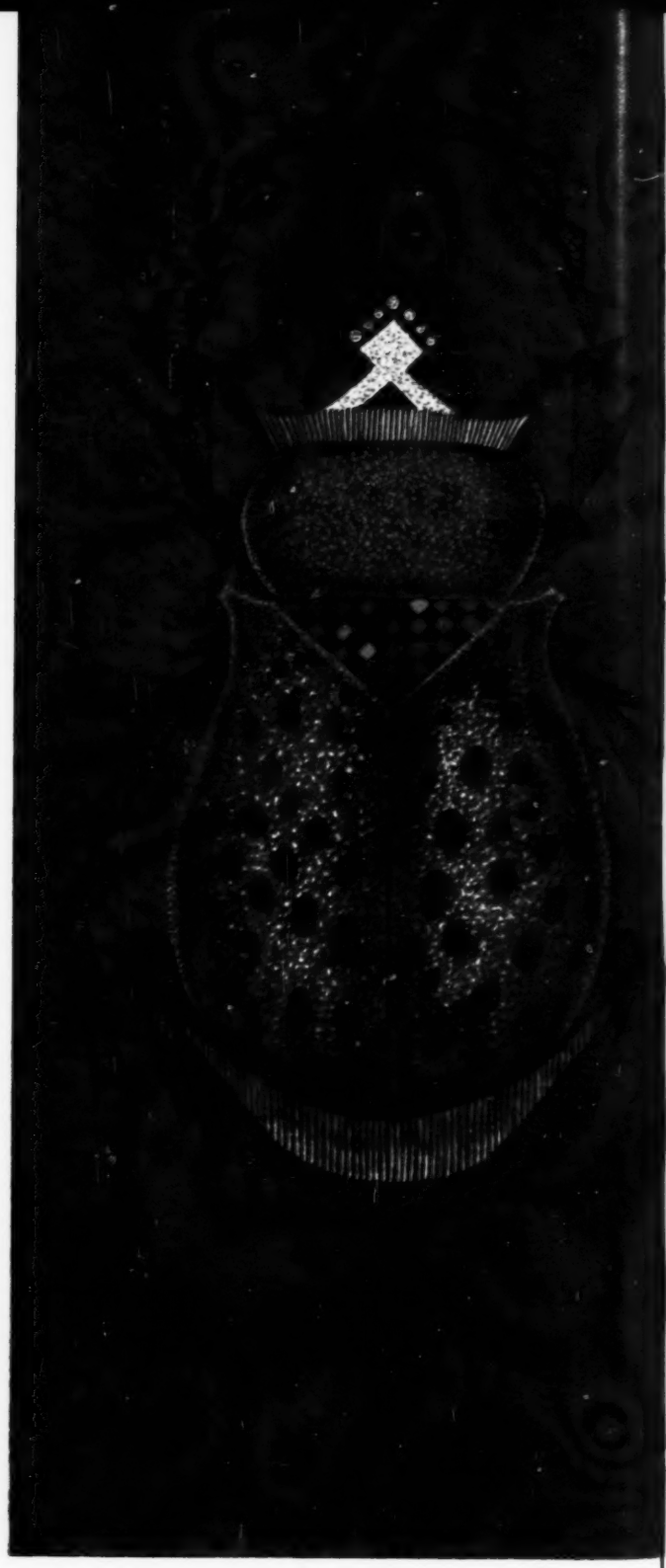

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THINKS AHEAD WITH TEXTILES

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AMERICAN
DYESTUFF REPORTER
Volume 48 July 27, 1959 Number 15

CHLORINE-RESISTANT BLENDS OF TRIAZONE AND UREA DERIVATIVES FOR WRINKLE-RESISTANT COTTON FABRICS

J G FRICK JR, RICHARD L ARCENEAUX, ROBERT M REINHARDT, and J DAVID REID
*Southern Regional Research Laboratory**
New Orleans, La

Wrinkle-resistant finishes prepared from blended methylol derivatives of ethyltriazone and urea are described. Some of these finishes are not subject to damage from retained chlorine and possess economical and other advantages over the triazone finishing agents used alone.

INTRODUCTION

IN RECENT YEARS the use of triazone derivatives as nitrogenous finishing agents for producing wrinkle-resistant and "wash-and-wear" cotton fabrics with good chlorine resistance has increased in popularity, particularly for the finishing of white goods. A good picture of the advantages and limitations of these agents is given in several presentations describing the finishes produced by these agents (*1, 2, 3*).

Chemically, the triazone finishing agents are the dimethylol derivatives of 5-substituted tetrahydro-s-triazin-2(1H)-ones (Figure 1). They are actually another type of cyclic urea and, as such, retain some chlorine after hypochlorite bleaching as do other agents in this class. The triazones are termed chlorine-resistant, however, because the presence of an alkaline amino group in their structure prevents damage by neutralizing the acid formed from the retained chlorine.

It has been pointed out (*2, 3*) that the neutralization capacity of the triazones was greater than that required to prevent acid damage from their own rather small chlorine retention. They could, therefore, be applied to fabric in a mixture with limited quantities of a highly chlorine-retentive agent and exert sufficient protective influence to prevent damage from the retained chlorine. The present paper describes the wrinkle-resistant finishes that are obtained by using mixtures or blends of a triazone derivative, dimethylol tetrahydro-5-ethyl-s-triazin-2(1H)-one (Figure 1, R = C_2H_5), the most common commercial triazone finishing agent, and urea-formaldehyde condensates. These blends afford an economical advantage because of the lower cost of the latter agent. In addition, they give some other improvements over the finish obtained from the triazone by itself, namely, better wrinkle recovery and muss resistance, and a reduced tendency to discoloration at high temperatures.

* One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, US Department of Agriculture.

EXPERIMENTAL PROCEDURES

The triazone, tetrahydro-5-ethyl-s-triazin-2(1H)-one, and its dimethylol derivative, DMET, were prepared as described previously (*3*). A 33⅓% solution of the dimethylol triazone is obtained by this procedure and was diluted to the concentration indicated in the tables for each treatment.

Two urea-formaldehyde preparations were used in these investigations. One was prepared by the addition of one mole urea to a formaldehyde solution containing two moles of formaldehyde and sufficient water to form a 20% solution of dimethylol urea. The solution was adjusted to pH 8.0—8.5 with sodium hydroxide, allowed to stand overnight, and used the following day. Before use, the preparation was neutralized with hydrochloric acid and diluted to the indicated concentration.

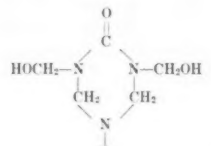


Figure 1
A dimethylol triazone

The second urea-formaldehyde condensate was prepared similarly but was composed of only 1.6 moles of formaldehyde to each mole of urea. This product probably is a closer approximation of the urea-formaldehyde products available commercially.

The fabric samples described in this paper were prepared from desized, caustic-boiled and bleached, 80 x 80 white cotton print cloth weighing 3.2 oz/sq yd. They were treated by padding with the solution described, using two dips and two nips to a wet pickup approximating 75%, followed by drying at 70° C for 10 minutes and curing at 150° C for three minutes on pin frames in an oven with circulating air. All samples were washed at 40° C with a nonionic detergent, rinsed, and dried in a tumble dryer as part of the treating procedure.

Treated samples were tested for: wrinkle recovery, by the Monsanto method, ASTM designation D1295-53T (*4*); tearing strength, by the Elmendorf method, ASTM designation D1424-56T (*4*); breaking strength, on strips raveled to 80 threads, ASTM designation D39-49 (*4*); and resistance to chlorine damage, by the "scorch test," AATCC tentative test method 69-1952 (*5a*). Results in the last test are reported as the percent of the breaking strength before bleaching that is retained after scorching. Durability of the finishes to laundering were tested by submission of the samples to a series of five hot, alkaline launderings, as described in AATCC test method 14-53 (*5b*).

SANDOZ

RESULTS AND DISCUSSION

Properties of cotton print cloth treated with the triazone and urea derivatives, blended in different ratio, and with three catalyst systems are presented in Tables I, II, and III. The data show that the amount of urea-formaldehyde condensate that can be used in the blend depends upon the catalyst system used and the ratio of formaldehyde to urea in the condensate. To allow maximum proportions of urea-formaldehyde without exceeding a given level of chlorine

TABLE I
Fabric properties obtained with triazone and urea-formaldehyde using amine hydrochloride catalyst[a]

UF Used[b]	Treating solution % UF	Treating solution % DMET	Add-on %	Fabric properties: Original — Wrinkle recovery deg, W + F	Original — Tearing strength g, W + F	Original — Breaking strength lbs, W	Original — Chlorine damage, % orig strength retained	After five AATCC 14-53 washes — Wrinkle recovery deg, W + F	After five AATCC 14-53 washes — Tearing strength g, W + F	After five AATCC 14-53 washes — Breaking strength lbs, W	After five AATCC 14-53 washes — Chlorine damage, % orig strength retained
—	0.0	7.5	3.3	272	827	41	93	265	846	36	92
A	3.0	4.5	2.7	274	765	38	92	266	820	39	75
A	4.5	3.0	2.7	276	766	37	80	262	813	36	52
A	5.5	2.0	2.8	277	760	39	55	260	800	37	30
A	6.5	1.0	2.5	282	720	38	41	272	840	36	20
A	7.5	0.0	2.6	287	720	36	25	274	767	35	19
B	3.0	4.5	3.1	278	753	38	97	266	813	38	69
B	4.5	3.0	3.0	272	783	38	57	258	820	39	31
B	7.5	0.0	2.7	271	760	41	26	259	800	35	15
—	untreated		—	181	1873	63	93	188	1467	54	90

[a] Monsanto Catalyst AC, 1.5% in solution. (The mention of tradenames and firms in this paper does not imply their endorsement by the Department of Agriculture over other similar products or firms not mentioned).
[b] A, 2.0 molar equivalents formaldehyde.
B, 1.6 molar equivalents formaldehyde.

TABLE II
Fabric properties obtained with triazone and urea-formaldehyde using zinc nitrate and acetic acid catalyst[a]

UF Used[b]	Treating solution % UF	Treating solution % DMET	Add-on %	Fabric properties: Original — Wrinkle recovery deg, W + F	Original — Tearing strength g, W + F	Original — Breaking strength lbs, W	Original — Chlorine damage, % orig strength retained	After five AATCC 14-53 washes — Wrinkle recovery deg, W + F	After five AATCC 14-53 washes — Tearing strength g, W + F	After five AATCC 14-53 washes — Breaking strength lbs, W	After five AATCC 14-53 washes — Chlorine damage, % orig strength retained
—	0.0	7.5	3.5	272	874	32	101	252	987	37	85
A	3.0	4.5	3.2	288	794	32	99	267	893	35	73
A	4.5	3.0	3.3	291	767	34	100	264	847	35	50
A	5.5	2.0	3.2	284	753	32	81	269	873	37	23
A	6.5	1.0	3.5	283	780	33	44	266	920	35	17
A	7.5	0.0	3.7	291	760	28	54	266	827	36	19
B	3.0	4.5	3.8	280	760	36	93	262	840	35	71
B	4.5	3.0	3.8	283	793	34	85	264	933	35	35
B	7.5	0.0	3.8	286	760	33	43	256	900	35	14
—	Untreated		—	198	1853	60	93	188	1907	53	90

[a] Catalyst, 0.5% $Zn(NO_3)_2 \cdot 6H_2O$ and 0.05% acetic acid in solution.
[b] A, 2.0 molar equivalents formaldehyde.
B, 1.6 molar equivalents formaldehyde.

TABLE III
Fabric properties obtained with triazone and urea-formaldehyde using zinc nitrate and hydrochloric acid catalyst[a]

UF Used[b]	Treating solution % UF	Treating solution % DMET	Add-on %	Fabric properties: Original — Wrinkle recovery deg, W + F	Original — Tearing strength g, W + F	Original — Breaking strength lbs, W	Original — Chlorine damage, % orig strength retained	After five AATCC 14-53 washes — Wrinkle recovery deg, W + F	After five AATCC 14-53 washes — Tearing strength g, W + F	After five AATCC 14-53 washes — Breaking strength lbs, W	After five AATCC 14-53 washes — Chlorine damage, % orig strength retained
—	0.0	7.5	3.8	277	913	33	96	265	1034	29	98
A	3.0	4.5	3.5	282	800	34	104	265	914	29	95
A	4.5	3.0	3.9	283	807	31	89	267	927	30	83
A	5.5	2.0	3.2	286	827	28	77	263	894	29	42
A	6.5	1.0	3.4	284	805	28	55	266	867	30	34
A	7.5	0.0	3.3	278	726	28	29	260	834	25	25
B	3.0	4.5	3.3	281	933	32	98	261	1100	29	87
B	4.5	3.0	3.1	273	933	32	71	261	1074	31	39
B	7.5	0.0	3.7	247	940	28	15	226	1080	27	14
—	Untreated		—	155	2000	50	90	188	1906	45	95

[a] Catalyst, 0.5% $Zn(NO_3)_2 \cdot 6H_2O$ and 0.1% HCl in solution.
[b] A, 2.0 molar equivalents formaldehyde.
B, 1.6 molar equivalents formaldehyde.

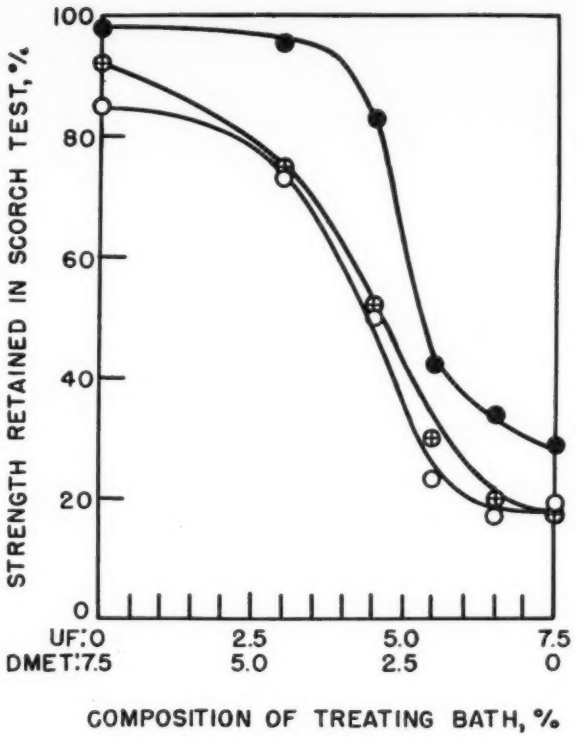


Figure 2

Effect of catalyst-system on chlorine damage, after five launderings, with various blends of finishing agents.

UF . . . . . Urea-formaldehyde with two molar equivalents of formaldehyde.

DMET . . . Dimethylol ethyl triazone.

Catalyst systems:

- ● **Zinc nitrate-hydrochloric acid**
- ○ **Zinc nitrate-acetic acid**
- ⊕ **Alkanolamine-hydrochloride**

damage in the scorch test, the higher molar ratio of formaldehyde, two moles for each mole of urea, and the zinc nitrate-hydrochloric acid catalyst should be used. The effect of the catalyst shows up most noticeably in the resistance of the fabric to chlorine damage after laundering. In Figure 2, this effect is shown graphically by the higher resistance to chlorine damage retained as the content of urea-formaldehyde increases when the zinc nitrate-hydrochloric acid catalyst is used.

The superiority of the zinc nitrate-acid catalyst over the amine hydrochloride could be expected because of the greater effectiveness reported for the metallic salt catalyst (*6*). Neither should the superiority of the zinc nitrate-hydrochloric acid catalyst over the zinc nitrate-acetic acid catalyst be surprising when the chemical nature of the finishing agents is considered. The use of acid with zinc nitrate was intended to prevent neutralization and deactivation of the metallic salt by the alkalinity of the triazone. The greater effectiveness of the hydrochloric acid is probably due to the greater stability of the salt formed with the triazone so that less acid is lost by volatilization before curing is completed. Although the stronger acid gives a treating bath of lower pH, it can be seen from the tables that no significantly greater strength loss occurs on fabric treatment than occurs with the other catalyst systems.

The noticeable differences in the effect of the different catalyst systems also point out a precaution that should be observed with these blends. In general, triazone finishes do not show drastic loss of chlorine resistance because of an incomplete cure. The excess neutralization capacity probably allows more than normal chlorine retention without ill effects. With the blends described, however, this neutralization capacity is used to its full extent with little allowance for further chlorine retention. Although not confirmed experimentally in this work, it is probably essential that a full cure be obtained.

TABLE IV

Resistance of triazone-ethylene-urea blends to chlorine damage after hydrolytic treatments

Treating solution[a]		*Percentage of original strength retained in scorch test*		
DMEU	*DMET*	*Original*	*After alkaline hydrolysis*[b]	*After acidic hydrolysis*[c]
3.0	4.5	94	101	92
4.5	3.0	94	95	89
7.0	0.0	88	81	49

[a] Contains 0.5% $Zn(NO_3)_2$ .6 H_2O in solution.
[b] 1% Na_2CO_3 pH 11, one hour at 80° C.
[c] Buffer solution, pH 3, one-half hour at 40° C.

Considering the best treatments, Table III, it was found that up to 3.0% urea-formaldehyde, with two molar equivalents of formaldehyde, can be used with 4.5% triazone without significant chlorine damage, before or after laundering. This ratio is approximately an equimolar proportion of dimethylol urea and dimethylol triazone. If somewhat more chlorine damage can be tolerated, but still less than 20% strength loss in the scorch test, a larger proportion of dimethylol urea, 4.5% to 3.0% triazone, or the condensate with the lower ratio of formaldehyde to urea could be used.

Besides the results in the scorch test noted in Table III, it was observed that the fabrics with the blended finish actually showed less tendency to discolor on scorching than those treated with either of the individual finishing agents. In addition, most of the fabrics finished with the blends showed greater wrinkle resistance, although the increase was small.

In applying the data obtained from this work to the preparation of blends with commercially available triazones, it must be remembered that the commercial products may already contain urea-formaldehyde condensates, either introduced intentionally or because of incomplete reaction in the preparation of the product. Since the data reported here were obtained with a purified triazone, the amount of urea-formaldehyde to be mixed with a commercial triazone product must be adjusted to allow for the urea-formaldehyde already present in the product. This will require knowledge of the composition of the product, or the optimum ratio must be determined experimentally.

Some investigations have also been made on blended finishes composed

(concluded on page 36)

"DYE BALLS" AND "FAMILY COLORS"
The Story of Packaged Dyes for the Home

SIDNEY M EDELSTEIN

Dexter Chemical Corp
New York, NY

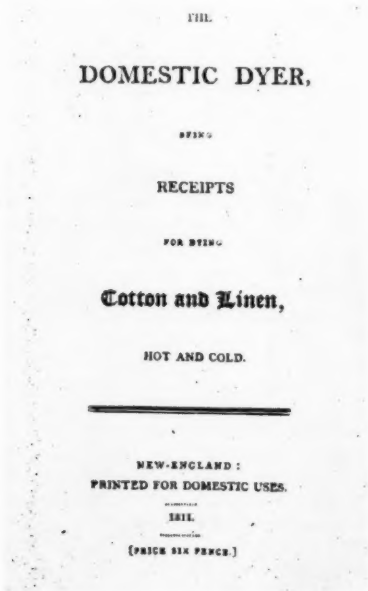
This is the seventeenth in a series of historical articles which the textile chemist and colorist will find of interest.

The author, a prominent science historian, is the founder of an outstanding collection of great works, documents and letters in the history of chemistry and related sciences.

Articles and illustrations in this series are from the author's library.

NONE of us will concede that the United States has a matriarchal type of society—at least we have not had as yet a female president. Nevertheless, in our society the housewife is queen. No other country has supermarkets like ours. We have packaged dinners, bottled cocktails, permanent wave kits and just about every possible device that makes life easier for the housewife. The use of a ready (prepared) mix for each type of cooking or household operation is "standard procedure." The rest of the world still has not caught up with us in this respect and foreign visitors usually go first to our supermarkets to see all these wonderful things before they go to our libraries or art museums.

America did not always have this leadership in being the first with household devices and packaged products. There was a time when many comforts and conveniences for the housewife were in use in England and France but unknown in this country. Toward the end of the nineteenth century, the United States began to take the lead in such developments and today shows no indication of losing her position. The story of dyeing in the home and the development of packaged dyes certainly illustrates our thesis.


THE

DOMESTIC DYER,

BEING

RECEIPTS

FOR DYEING

Cotton and Linen,

HOT AND COLD.

NEW-ENGLAND:
PRINTED FOR DOMESTIC USES.

1811.

[PRICE SIX PENCE.]

Figure 1
Title page, early American pamphlet on home dyeing

Now, in beginning our story, we must remember that only in very recent times, even in this country, did the average woman buy more than one dress each year or the average man even one suit each year. I am sure that many of us remember when our mothers and sisters each had one silk dress which lasted for years. Their spirits were lifted for a special occasion, not by discarding the dress for a new one but, by changing its color. If a dress or suit became old, it was redyed. A dress, a pair of stockings or a shirt was a precious possession to be kept as long as possible. The colors might fade or lose their brilliance, but they could be renewed or changed. The redyeing of garments therefore has been an important activity for many, many centuries in many countries including our own.

Interestingly enough, the first book on dyeing ever printed was concerned with dyeing in the home, not with commercial dyeing (*1*). The dyeing recipes in the little volume tried to make use of coloring matters that the 'country' person might find near him. Actually, over the centuries, a number of little books concerned with the dyeing of garments in the home were published in many lands. For the most part, they made use of local barks and nuts, but for some colors expensive dyestuffs, such as indigo, were required. Some of the techniques also required a considerable amount of skill, particularly dyeing with indigo. Because of these difficulties, there grew up in many of the little villages of Europe small establishments where people could have their garments redyed. For centuries, though, most of the 'country' people did their own dyeing at home.

In this country, most people also did their own dyeing and redyeing at home. Small and inexpensive recipe books on dyeing were sold at fairs and country stores. For the most part, these also tried to make use of local materials. A typical example is shown in Figure 1. The title of the book, "The Domestic Dyer," speaks for itself. The paper is poor, but the price was only sixpence. The place of publication, "New England," probably meant that the book was sold by a peddler travelling through the New England states in the early nineteenth century.

In this little book most of the formulas are based on dyestuffs and drugs which were usually available at the nearest country store or perhaps were offered by the peddler. These were such things as indigo, logwood, fustic, alum, copperas and oil of vitrol. The author of "The Domestic Dyer," however, also gives formulas for dyeing yellow with onion peel and flesh color with black birch bark and hemlock bark. The recipe for "flesh color—on cotton and linen, hot," is typical:-

Auf
Erfahrung gegründete
Vorschriften,
um
Wolle, Leinen und Baumwolle
zu färben.

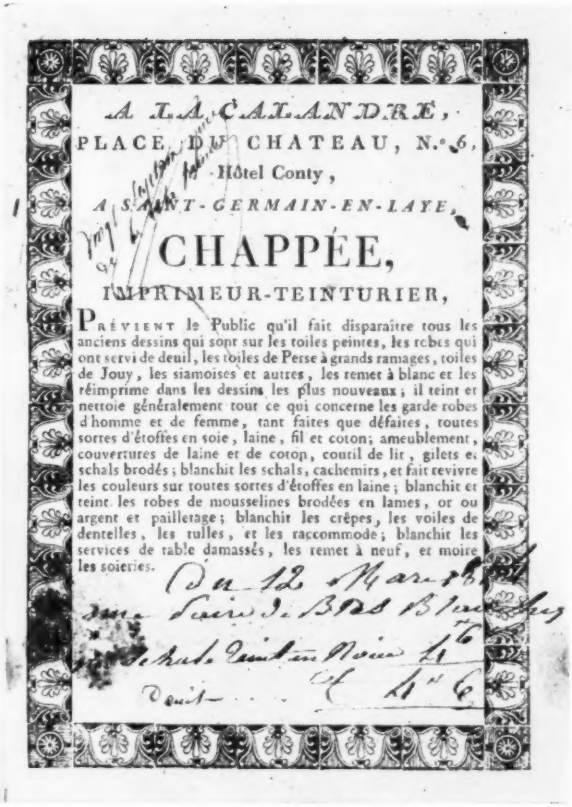
Für
Haushaltungen eingerichtet.

Worinnen nicht nur auf eine vortheilhafte Art, sondern auch eine sichere, einfache, und mit Ersparung verbundene Methode, diejenigen Rezepte dargestellt sind, die eine gute Hausfrau, die sich der Färberey befleißiget, zum Nutzen und Vortheil finden wird.

Herausgegeben
von
Christian Kramb.

Libanon,
gedruckt bey Heinrich B. Sage, 1809.

Figure 2
Title page, rare American-German book on home dyeing



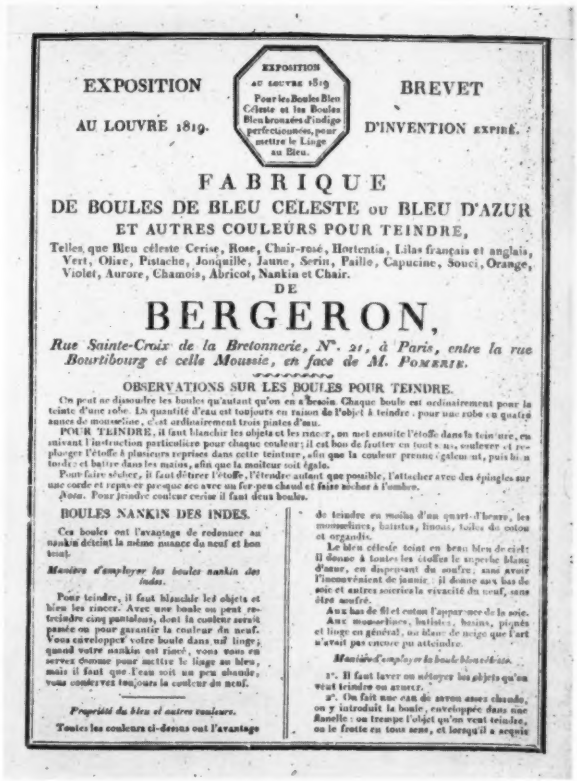
A LA CALANDRE,
PLACE DU CHATEAU, N.° 6,
Hôtel Conty,
A SAINT-GERMAIN-EN-LAYE,

CHAPPÉE,

IMPRIMEUR-TEINTURIER,

PRÉVIENT le Public qu'il fait disparaître tous les anciens dessins qui sont sur les toiles peintes, les robes qui ont servi de deuil, les toiles de Perse à grands ramages, toiles de Jouy, les siamoises et autres, les remet à blanc et les réimprime dans les dessins les plus nouveaux; il teint et nettoie généralement tout ce qui concerne les garde robes d'homme et de femme, tant faites que défaites, toutes sortes d'étoffes en soie, laine, fil et coton; ameublement, couvertures de laine et de coton, coutil de lit, gilets et schals brodés; blanchit les schals, cachemirs, et fait revivre les couleurs sur toutes sortes d'étoffes en laine; blanchit et teint les robes de mousselines brodées en lames, or ou argent et pailletage; blanchit les crêpes, les voiles de dentelles, les tulles, et les raccommode; blanchit les services de table damassés, les remet à neuf, et moire les soieries.

Figure 3
Advertisement for Chappee's dyeing establishment used as a receipt



EXPOSITION AU LOUVRE 1819.

EXPOSITION AU LOUVRE 1819. Pour les Boules Bleu Céleste et les Boules Bleu bronzées d'indigo perfectionnées, pour mettre le Linge au Bleu.

BREVET D'INVENTION EXPIRÉ.

FABRIQUE
DE BOULES DE BLEU CÉLESTE ou BLEU D'AZUR
ET AUTRES COULEURS POUR TEINDRE,

Telles que Bleu céleste Cerise, Rose, Chair-rosé, Hortentia, Lilas français et anglais, Vert, Olive, Pistache, Jonquille, Jaune, Serin, Paille, Capucine, Souci, Orange, Violet, Aurore, Chamois, Abricot, Nankin et Chair.

DE

BERGERON,

Rue Sainte-Croix de la Bretonnerie, N°. 21, à Paris, entre la rue Bourtibourg et celle Moussie, en face de M. POMERIE.

OBSERVATIONS SUR LES BOULES POUR TEINDRE.

On peut ne dissoudre les boules qu'autant qu'on en a besoin. Chaque boule est ordinairement pour la teinte d'une robe. La quantité d'eau est toujours en raison de l'objet à teindre : pour une robe ou quatre aunes de mousseline, c'est ordinairement trois pintes d'eau.

POUR TEINDRE, il faut blanchir les objets et les rincer, on met ensuite l'étoffe dans la teinture, en suivant l'instruction particulière pour chaque couleur; il est bon de frotter en tout sens, couleurer et replonger l'étoffe à plusieurs reprises dans cette teinture, afin que la couleur prenne également, puis la tordre et battre dans les mains, afin que la moiteur soit égale.

Pour faire sécher, il faut détirer l'étoffe, l'étendre autant que possible, l'attacher avec des épingles sur une corde et repasser presque sec avec un fer peu chaud et faire sécher à l'ombre.

Nota. Pour teindre couleur cerise il faut deux boules.

BOULES NANKIN DES INDES.

Ces boules ont l'avantage de redonner au nankin délicat la même nuance du neuf et son tout.

Manière d'employer les boules nankin des indes.

Pour teindre, il faut blanchir les objets et bien les rincer. Avec une boule on peut reteindre cinq pantalons, dont la couleur servit passée ou pour garantir la couleur du neuf. Vous enveloppez votre boule dans un linge; quand votre nankin est rincé, vous vous en servez comme pour mettre le linge au bleu, mais il faut que l'eau soit un peu chaude; vous conservez toujours la couleur du neuf.

Propriété du bleu et autres couleurs.

Toutes les couleurs ci-dessus ont l'avantage de teindre en moins d'un quart-d'heure, les mousselines, batistes, linons, toiles de coton et organdis.

Le bleu céleste teint en beau bleu de ciel: il donne à toutes les étoffes le superbe blanc d'azur, en disposant du soufre, sans avoir l'inconvénient de jaunir; il donne aux bas de soie et autres soieries la vivacité du neuf, sans être soufré.

Aux bas de fil et coton l'apparence de la soie.

Aux mousselines, batistes, linons, pignés et linge en général, un blanc de neige que l'art n'avait pas encore pu atteindre.

Manière d'employer ce bleu céleste.

1°. Il faut laver ou nétoyer les objets qu'on veut teindre ou azurer.

2°. On fait une eau de savon assez chaude, on y introduit la boule, enveloppée dans une flanelle : on trempe l'objet qu'on veut teindre, on le frotte en tous sens, et lorsqu'il a acquis

Figure 4
Advertisement for "dye balls", 1819

"Take one and an half bushels of black birch bark, and half a bushel of hemlock bark, boil well; then add a quarter of a pound of allum, and two ounces of pearlash; run your cloth or goods til your color pleases." (2).

Now, English was not the only language used in this country at the beginning of the 19th century. German was important, particularly in parts of Pennsylvania and Maryland. The German-language-speaking people also had their little books on dyeing in the home. An extremely rare yet typical example of this is a little book published in Lebanon, Pennsylvania, in 1809, and written by Christian Kramb. (Figure 2). A very free translation of the title page of the book says that it is

> " . . . concerned with tested methods for dyeing wool, linen and cotton for household use. Not only a useful method but also a safe, simple and economical procedure will be found in each recipe so that any good housewife who applies herself to dyeing will find the recipes useful and profitable." (3).

The German-speaking housewife redyed her old garments in the same way as her New England sister did, by using indigo, logwood, copperas, oil of vitrol and local barks and berries.

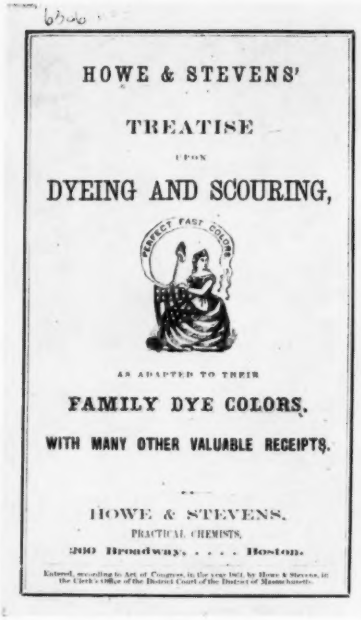
At about the same time in Paris, however, the people did not need to dirty their fingers with indigo or burn them with acid in redyeing their garments. Skilled dyers were in business and even then were using "Madison Avenue" techniques to get their customers. For example, a Monsieur Chappee, who had his place of business "at the sign of the calender" was passing out handbills which

> " . . . informs the public that he removes old designs from printed fabrics, mourning garments, persian fabrics with flower designs, fabrics made by Jouy, siamese and others. He makes them white and clean and he reprints them with the newest designs: he cleans and dyes everything concerned with the care of men's and women's clothes, from top to bottom, all sorts of silk stuffs, wool linen and cotton: furniture covers of wool and cotton, bed ticking, embroidered vests and shawls. He bleaches and cleans shawls, cashmeres and renews the colors of all kinds of woolen stuffs. He cleans and dyes gowns of muslin embroidered with lame gold or silver spangled. He cleans crepes, voiles of lace, tulles and repairs them: he bleaches damask table linens, makes them like new and waters silks." (Figure 3).

Chappee really offered a complete service. We don't know just how much Chappee and his competitors charged for their services, but we do know that there were many people who just couldn't afford to pay their prices. In fact, one author of a little book on dyeing for home use in his introduction had this to say: -

> "The author of this work has been induced to publish it from a conviction that the prices charged by the dyers prevent many persons who live at a distance from great towns, from having their clothes dyed, as the payment of the carriage and the dyeing together sometimes amounts to more than the value of the article."

But even this author could only offer the housewife a rather tedious system of dyeing. Her dyestuffs were not standardized, and the formulas



HOWE & STEVENS'

TREATISE

UPON

DYEING AND SCOURING,

AS ADAPTED TO THEIR

FAMILY DYE COLORS,

WITH MANY OTHER VALUABLE RECEIPTS.

HOWE & STEVENS,
PRACTICAL CHEMISTS,
209 Broadway, ... Boston.

Figure 5
Title page, Howe and Stevens' booklet

Figure 6
Color card of Howe and Stevens' "Family Dye Colors"

were difficult to prepare. In short, a housewife had to be just as skilled as a professional dyer. Her kitchen required almost the same equipment and materials as did a dyehouse, if she was going to do her own dyeing.

A Frenchman by the name of Bergeron was probably the first to recognize and to do something about the housewife's plight. He put on sale the first prepared and standardized dyes for home use. This was almost a century and a half ago.

At the Exposition at the Louvre in Paris in 1819, Bergeron exhibited his "dyeing balls." Each ball was enough to dye approximately one garment. Figure 4 shows the advertising literature that Bergeron apparently passed out to the visitors at the Exposition who stopped at his booth. Not only did he manufacture balls for bluing, but also dyeing balls for "cerise, rose, French and English lilac, olive, pistachio, canary, orange, violet, apricot, nankin and flesh."

Bergeron claimed that all of his colors

> " . . . had the advantage of dyeing in less than ¼ hour, muslins, batistes, linens, cotton fabrics and organdies."

and that

> "The blue-celeste ball gives a fine sky blue. It gives to all fabrics a superb blue white without the use of sulfur: without the inconvenience of a yellow color: it gives to silk stockings and other silks the brightness of newness, without being sulfured. To linen and cotton stockings, the appearance of silk. To muslins, batistes, dimities, piques and linens in general it gives a snow whiteness which art has not been able to achieve heretofore."

One can only speculate about Bergeron's success and as to how he made his "dyeing balls." Search of all sorts of literature has failed to give any information. The books on dyeing of the period don't even mention his name. The piece of advertisement handed out at the Exposition in 1819 is the only source of information on his "born too soon" invention.

Apparently, Bergeron's invention did not make any great impact, for even in 1856, the year of Perkin's mauve, people were still dyeing their garments at home with the same type of dyestuffs and with the same methods as were used in the commercial dyehouses.

By 1863, however, two Americans, Manley Howe and Henry R Stevens of Boston, Massachusetts, also had determined to do something about the housewife's problem of dyeing garments at home. On October 13, 1863, U S Patent No. 40,263 was issued to these two men for "Improvement in the Preparation of Dye-Colors." The preamble of this patent is particularly interesting in the light of our discussion.

> "Be it known that we Manley Howe and Henry R Stevens both of Boston of the County of Suffolk in Salem, Massachusetts, have invented certain new and useful improvements in the preparation or manufacture of dye colors; and we hereby declare that the following is a full clear and exact description of the same.
>
> "Dyes as heretofore prepared could only be used by dyers or those acquainted with the art of dyeing stuffs.
>
> "The object of our invention is to produce dye-colors which may be used by those uninitiated in that art, and thus to afford to families or individuals facility economically to dye faded or soiled or new articles of wear, whether the same be made of silk, wool, cotton or other vegetable or animal fibers." *(4).*

In essence, their invention was to take any of the various natural dyestuffs, grind them to a fine powder and then to mix with them dry powdered mordants—either alum, or a tin mordant, so that a uniform powder was obtained. As an alternate method, a liquid extract of a dyestuff together with a solution of a mordant were evaporated to dryness to furnish a uniform dry mixture which could be ground to a powder. These powders were thus self-prepared complete dyeing ingredients, which did not require separate weighing, grinding or extracting.

Now, apparently, this was no paper patent. By the year 1864, Howe and Stevens were regularly selling their "Family Dye Colors," and had published a little book containing instructions for their use. (Figure 5). At the back of the book samples of yarns dyed with each of the thirty different "Family Dye Colors" were included. (Figure 6).

The preface to Howe and Stevens' little book is particularly interesting.

> "In adapting the Family Dye Colors to the use of all persons, we have not been assisted by any precedent, ours being the original dyes put up for family use; consequently, we could not, at once, comprehend every fact and state every particular necessary to the

working of our dyes to the best advantage; but as each necessity developes itself, invention is brought to its aid; and as it is impossible for us to state every particular in the short directions enclosed inside each package, we have found it necessary to publish this small pamphlet, wherein we have endeavored to state every particular that could be of service. . . .

"It has been our desire to make these dyes an economical and useful article, as well for the interest of others as our own; and believing this pamphlet secures that in, we respectfully submitted to the test of the public." *(5)*.

From detailed study of the directions furnished for each color by Howe and Stevens and from examination of the dyed yarns at the back of their book, it is possible to determine the nature of the dyestuffs used. The crimson and the scarlet colors were based on cochineal and contained tin as the mordant for the scarlet and alum as the mordant for the crimson. The blacks actually consisted of two packages of powders, one inside the other. The outside package contained the mordant, which was either chrome or iron salts. The inside package contained powdered logwood. Most of the other colors were based on alum ground up with the standard dyewoods.

Howe and Stevens were really up to date, for in 1864 they were already offering to the housewife some of the new synthetic dyestuffs just being manufactured in Europe. Actually, five of their "Family Dye Colors" were solutions of the new magenta and mauve dyestuffs newly imported from Europe. Apparently, the brilliance of these colors overbalanced the high cost, for under the discussion of solferino, Howe and Stevens had this to say: -

> "This is a liquid color put up in bottles, and quite costly. It will not color so large a quantity of goods, as the same priced powder colors. We do not put up these colors warranting them to color so much, but make them as strong as we can afford to for the price we get for them. We shall increase their strength as soon as the price of stock will allow. This color is too brilliant for a lady's dress, but does very well for a child's dress, and will color equally well Silk, Woolen, or Feathers."

Technically, cotton fibers posed a particular problem to Howe and Stevens. Today, of course, cotton is one of the easiest fibers to dye because of the availability of direct cotton colors which require no mordants. This was not true in 1864. The colors in use then required mordants and the mordants had to be fixed onto the fibers. While silk and wool had an affinity for such mordants as alum and tin, this was not true to any extent for cotton. Howe and Stevens got around this by requiring the housewife to use a special cotton preparation which gave cotton some affinity for the alum or tin mordants in their "Family Dye Colors." Actually, the cotton was "proteinized." The directions for accomplishing this are interesting: -

> "Take a handful of slacked lime, add this to two or three pailfuls of water, stir, put in the goods, handle occasionally, and in about two hours take out the goods, pour off the clear liquor from the lime into another vessel, add to this clear liquor two quarts of milk (if for a full dress), put back the goods into this lime water and milk, heat to hand heat, handle the goods in this one half hour, take off the fire, and let the goods steep in this one night, or four or five hours during the day, handling occasionally; take out, rinse lightly, hang up to dry and when dry they are ready to dye."

As one would expect, the pioneer work of Howe and Stevens was copied by others, and by the end of the 19th century, packaged dyestuffs for home dyeing could be bought at

RIT
Smart and gay with "Rit"-ed colors!
ALL the joyous colors of Paris and the Continent are yours to RIT. Smartly gowned and conscious of perfect color harmony you go gaily forth for the afternoon. How completely satisfying RIT has proven is indicated by the 5,000,000 packages sold every month.
"Rit" your blouses, silk hose, lingerie—your every dainty fabric. Washes and "Rit"-s in one operation. Restores color and brings new shades. Cannot injure any washable fabric.
Fashionable RIT Colors
Black
Pink
Rose
Old Rose
Salmon Pink
Red
Yellow
Peach
Tangerine
Canary Yellow
Golden Yellow
Emerald Green
Light Green
Light Grey
Battleship Grey
Chartreuse
Taupe
Mustard
Lavender
Light Blue
Dark Blue
Orange
Tan
Brown
Also FLAKED RIT, in a variety of colors, for sheer washable materials, and POWDERED RIT FOR BOILING—dark colors only—for heavy materials.
Give your cherished fineries a SUN FLAKE bath—feathery flakes of pure white soap that won't shrink woolens.
SUNBEAM CHEMICAL COMPANY
(A Corporation)
2436-42 W. 19th St., Dept. T19 CHICAGO
Los Angeles Cable, Wis New Orleans
New York Paris London
Makers of OZOL—the Superior Antiseptic, Disinfectant and Germicide
(Trademarks Reg. U. S. Pat. Office)
SUN FLAKES
FOR LAUNDERING
FLAKED RIT
RIT
POWDERED RIT
Never say "dye" - say "RIT"

Figure 7
First advertisement for first soap-dyestuff package, 1916

every drugstore or country store in the most remote part of the United States.

The first basic improvement on Howe and Stevens' "Family Dye Colors" was the invention of a cake of soap containing dyes so that a fabric could be washed and tinted at the same time. This was introduced in 1916 under the name of Rit by a Mr Hufman. (Figure 7). Many other improvements have followed until today an all-purpose packaged dye can be obtained for home use, which will dye every fiber or fiber mixture. This product is a unique mixture of salt, direct dyes, neutral-dyeing acid colors, and disperse dyes, together with surface-active agents especially developed for this application *(6)*.

The manufacture of packaged dyes for home use is still a growing industry both in the United States and in other countries. The introduction of the modern washing machine into so many American homes has given the American housewife a new and efficient dyeing machine. Things have made a full turn. The kitchen again becomes a dyehouse — because we have tried to make things easy for the "American Queen."

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Chlorine-Resistant Blends of Triazone and Urea Derivatives for Wrinkle-resistant Cotton Fabrics

(concluded from page 31)

of triazone and dimethylol ethyleneurea, although they were not as extensive as the investigations of the blends with urea-formaldehyde. The ethyleneurea blends did show some advantage over the straight ethyleneurea finish. As shown in Table IV, the finish produced by a mixture of DMET with a commercial dimethylol ethyleneurea (DMEU) preparation did not lose its resistance to chlorine damage after hydrolytic treatment as the straight ethyleneurea finish did. This should correct the failure of the ethyleneurea finish to retain its chlorine resistance on repeated laundering. Economically, however, the triazone-ethyleneurea blend seems to have little or no advantage over the triazone used alone.

SUMMARY

Wrinkle-resistant cotton fabrics have been prepared by applying mixtures of the methylol derivatives of purified ethyltriazone and urea. These mixtures or blends can contain up to 50% of the urea-formaldehyde component without causing great susceptibility to damage by retained chlorine. They should, therefore, be significantly less expensive than the usual triazone finishing agents. In addition, other advantages over the straight triazone finishes are obtained, such as a reduced tendency to yellowing on overheating. The use of the blends, however, does necessitate greater care in the selection of catalyst and in the treatment of fabric than required with the straight triazone agents.

Blended finishes also have been prepared from the methylol derivatives of ethyltriazone and ethyleneurea. The resistance to chlorine damage of this blend shows greater durability under hydrolytic conditions than the straight ethyleneurea finish, but the blend appears to have no advantage over the straight triazone finish.

ACKNOWLEDGMENT

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• PATENT DIGEST •

PAUL WENGRAF

APPLICATION OF ANTISTATIC AGENTS ——— Sulfonating the surface of polyethylene articles
G,1

USPat 2,832,696-8 (Dow Chemical Co——Walles ——April 29, 1958)

The static-preventing method protected by US Pat 2,832,696 calls for a sulfonation pretreatment of the surface of polyethylene articles, eg, fibers or films, followed by application to the sulfonated surface of an antistatic agent containing both hydrophobic and hydrophilic groups and a functional basic N atom in the molecule. Antistatic compounds of this type employed in the past frequently did not sufficiently adhere to polyethylene articles. Thus no specific antistatic agents having the above characteristics are protected by the claims. A series of commercial products suitable for this purpose is presented in a table (col 3 and 4, lines 18-64). Among them is a condensate of a long-chain fatty amine containing 8-16 C atoms with average of 20 ethoxy

(continued on page 52)

Proceedings of the

American Association of Textile Chemists and Colorists

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July 27, 1959

Delaware Valley Section———

INSTRUMENTATION—AN INTEGRAL PART OF DYEING AND FINISHING*

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Manager, Textile Div
The Foxboro Co
Foxboro, Mass

INTRODUCTION

BECAUSE of large returns possible from relatively small investments in instruments for dyeing and finishing, it is important to review this field periodically and update previous papers given on this same subject *(1, 2, 3)*.

Let us begin by agreeing that, in a modern finishing or dyeing operation, the measurement and control of variables, such as temperature, pressure and flow, are of the utmost necessity. We are taught this in textile school long before we ever get inside a mill. However, not until recently have these schools taught the details of specific instruments for these measurements, let alone the more complicated principles of automatic control.

Let us further agree that, until recently, few consulting engineers have been engaged for process design and improvement of machine operation by the use of instruments. For the most part, these functions have been performed by people such as yourselves, working with the Technical Service Departments of the chemical companies and the machinery makers. Most mills admit that very few of their staff have an intimate knowledge of instrumentation and keep up-to-date on the capabilities of new instruments. As a result, instruments are seldom considered until after decisions have been made which prevent them from being included as an integral part of the process or new machinery operation.

It will be the purpose of this paper to show you that instruments *are* an integral part of dyeing and finishing —and that the industry will make faster progress toward greater efficiency just as soon as this philosophy is adopted.

DISCUSSION

Your own supplier of chemicals or synthetic fibers has, for years, used instruments as an integral part of his machinery operations. In contrast to the textile industry, these manufacturers have on their staffs qualified instrument engineers who are in intimate contact with the operations and have a complete knowledge of the processes. Thus, when improved methods or new process techniques are being planned, instruments are considered immediately—not overlooked until it is too late to take advantage of their benefits. Very frequently, the instrument engineer, who is well qualified to judge such matters, will recommend a newly developed instrument which, in itself, will trigger plans for radical changes in process operations to bring about a dramatic product improvement.

An editor of one of the prominent textile trade papers recently told of a tour he made through one of the newest synthetic fiber plants. He was amazed at the major part instruments played in the manufacture of this fiber and wondered if our textile mills were not handicapping their operations by not proceeding more rapidly along similar lines.

Except in the larger textile mills or groups, an instrument engineer or group is not yet economically justified, because of poor business conditions. However, this should not prevent such a move being approached on a long-range basis. In the meantime, there are two alternatives which might be considered. One is to employ the services of a consulting engineer to make periodic reports and to participate in any new process designs. The other is to use the services of graduate engineers representing well-known and well-established instrument manufacturers.

Because of the highly competitive nature of the textile industry, the chemical suppliers and the machinery and instrument makers furnish a great deal of application know-how to the industry without charge. This information frequently is in the form of technical data sheets on new products and their uses. Perhaps, because of the relative newness of the instrument industry and the lack of a sufficient number of mill personnel with a basic understanding of instruments, the field engineer of the instrument maker has greater difficulty in gaining the confidence of mill personnel, such as yourselves, who are keenly interested in making advancements in the manufacture of textile products. However, as communication lines continue to improve, this situation will assuredly be resolved.

APPLICATIONS

DYEING———In the dyeing of textile fibers in any form, batch or continuous, there is a very great need for reliable process instruments. More often than not, they need to be combined into a control unit or system so that, at one central location, the process variables may be observed, recorded and automatically controlled. Basically, this equipment should be combined with the start-and-stop stations and other similar remote control equipment.

In continuous dyeing, it has always been difficult to produce colors of uniform shade and density. And, traditionally, there has been the related problem of adding the proper amount of chemicals, some of which are very costly. With the advent of the Redox measurement, the Marhen Process *(4)* was introduced and provided greatly improved control of hydrosulfite addition for vat dyestuffs. As a consequence, great savings were made, better color yield resulted and a more uniform product was produced.

However, several other chemicals

* Presented January 23, 1959, before the Delaware Valley Section at Kugler's Restaurant, Philadelphia, Pa

had to be added if the dyeing range were to be made continuous. Until recently, there has been no way to automatically control these additions. The answer was provided by the development of a magnetic flow meter, which measures and automatically ratios the flows of all the variables in a continuous dye range. The meter, made in sizes from 1/10-inch diameter and up, has no restrictions and will handle practically any dye or chemical being used today. The flow scale is uniform and accurate from zero to maximum flow.

Thus, it is now possible, by measuring the flow of dye liquor being picked up at the padder, to ratio and control the flow of all other chemicals in proportion to the dye pickup. Some of the smaller size meters are now installed and operating on dye feed for solution-dyed fibers. Still another installation, metering and controlling the application of a resin finish or coating, has shown no variation between indicated flow and actual flow.

Batch dyeing involves a simpler type of flow measurement, especially on pressure-dyeing machines; yet the control system is considerably more complex. In addition to flow control in both directions, it is sometimes necessary to have pressure control overriding flow control to prevent cloth damage at certain stages in the cycle. Again, the temperature during the dyeing cycle is most important and should be tied in with the flow. Both temperature and flow are being recorded on the same chart in many of these pressure-dyeing installations.

On today's standard conventional pressure-dyeing machine, there is, in addition to temperature and flow control, a reversal control system which automatically reverses the flow on a regular or irregular frequency. Also, starting and stopping equipment is usually supplied for the circulating pump motor, while remote control stations are added for manually operating the various steam and water valves which are normally under automatic control. The result is a complicated, yet highly efficient, control cabinet for controlling temperature, flow, pressure, and flow reversal in a batch dyeing operation.

At the present time, a pressure-dyeing machine is being produced, which is even more completely automatic than existing models. On this unit, the controlled dyeing cycle is carried completely through to the finish, including the final washing-off operation. Seven chemical tanks and a "fill" valve are automatically sequenced, in addition to automatically operated drain, overflow and wash valves. Five different temperature-control points are required during the cycle, and there are two different rates of temperatures rise and fall, which must be controlled and easily changed.

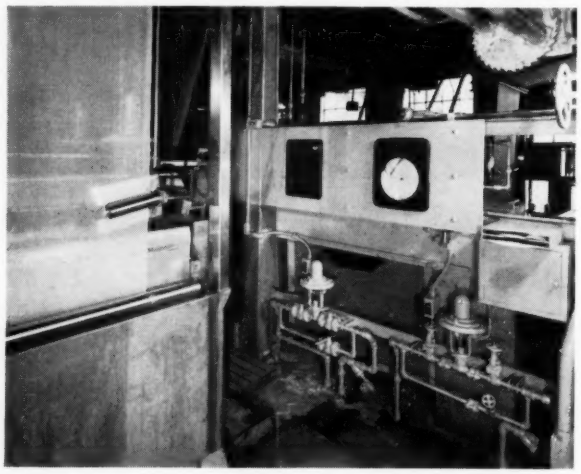

Figure 1
Installation on one of two cloth pH control finishing ranges in trouble-free operation for over five years.

This is an indication of what is coming in the future. On simpler batch dyeing operations, known as piece-dyeing machines, the instrument that automatically controls the heating and cooling now controls rinsing as well. This is a natural and logical development. For many years, we have had available a camless time schedule temperature controller for batch dyeing operations, known as the Foxboro CycleLog Controller. Another such unit has been recently introduced by the Taylor Instrument Companies. So, we have controlled rate of rise, adjustable hold, and controlled rate of fall or cool-back after the dyeing has been completed. Now, in addition, we are able to automatically operate the rinse valve and complete the wash-off cycle after the cool-back has been completed to the point where there is no longer any danger of cloth damage.

As a result, this instrument becomes more valuable. The operator, after his dyeing has been approved, can set the rate of cool-back, the time required for rinsing, and then leave the dye kettle to perform automatically until he is called back by the alarm at the end of the cycle. Less water will be used and each batch of goods will be treated more uniformly than would be possible under manual control. Likewise, the operation is completed in less time.

FINISHING———Much progress is being made toward a completely instrumented cloth or dolly washer. There are a few installations where the entire cycle is automatically controlled. As one research engineer for a large chemical company told me recently, "After all, there is no reason why we should not be able to do, eventually, in the textile industry what is already being done by the home washer."

In one case, additional effort is being exerted to combine the dolly washer with the piece-dye kettle. This, of course, permits these two operations to be performed at the same machine and, furthermore, performed automatically. Naturally, this results in a control system that is quite complicated, judging from today's standards.

Automatic control of the filling, draining, chemical additions, water flow, level, pH and temperature, plus the variable scouring, rinse, and dyeing period, are the essential requirements of such a system. Much cooperative work must still be done by the instrument and machinery makers before this equipment will be generally available in the form of new machinery and integrated instrumentation.

More progress is being made in this direction on continuous scouring and finishing ranges. Actually, the instrumentation is simpler when the system is considered in its entirety. As in the cloth washer, pH is one of the necessary measurements on the continuous range. All of you are familiar with pH in the laboratory and some of you have had considerable experience with process installations. For

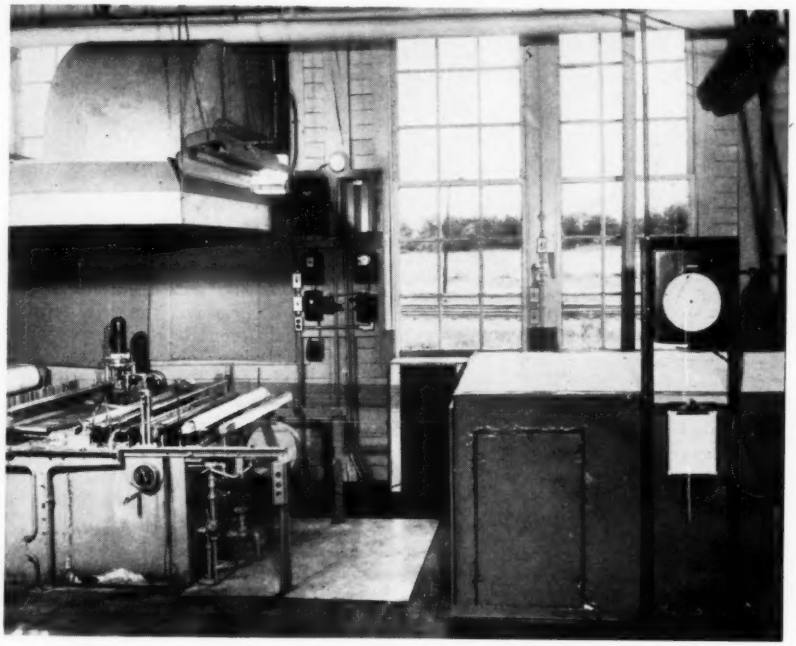

Figure 2
Foxboro Dynalog recorder-controller governs viscosity of nylon bonding solutions for threads. Viscosity is measured at applicator by Brookfield Viscometran transmitter.

actual industrial applications, as distinct from laboratory use, it is a difficult measurement, especially when tied in with automatic control.

The answer lies in proper installation and a rigid program of scheduled maintenance. If these requirements are followed, there is essentially no trouble. In one mill, there are two pH controllers still in operation after five years of steady performance. During that time, they have never been operated on manual control for more than a few minutes of maintenance and adjustment. (See Figure 1).

Conductivity measurement and control for scouring, carbonizing and caustic treatments require even less maintenance than pH. Interestingly, the major problem is with the pneumatic control valve. It must have good throttling or proportioning characteristics and still withstand the chemicals involved. A new 100 percent plastic PVC valve is so designed that even the stem and stuffing box are made from plastic. Such a valve is required for 10 to 13 percent sulfuric acid solutions.

It is a rarity today to find a new decating machine installed without an automatic control system for the whole cycle. It has taken approximately 15 years to perfect the basic control systems and have them accepted by the trade. However, still overlooked is the value of production records which would be available on the recording, rather than "blind" type controller. These valuable records can be used not only for quality checks but, in some cases, as a basis for piece-work production. The operator, at the end of each shift, turns in his signed chart record, which also shows quality and uniformity of the work done.

The controversial "wash-and-wear" cottons have much to gain from process instrumentation. Automatic density control of the additional caustic treating bath is just one of the ways to improve quality and uniformity. Frequently, "wash-and-wear" fabrics may be passed through the mercerizing machine twice. If exact strength is not maintained in the strong caustic saturator, non-uniform treatment assuredly will develop. Recently, it has also been found advantageous to maintain concentrations of the caustic being circulated through the cloth on the wet tenter, and instruments are being successfully used for this purpose.

Air drying of textiles represents an application where there is still room for improvement in instrumentation. Accurate moisture measurement in materials of varying construction and fibers is still difficult and complicated, except on specialized applications. One new approach which looked quite fascinating at the start later turned out to be worthless. The idea was to have the water slightly radioactive, using a source of radiation that would decrease as the moisture disappeared. Thus, by detecting the amount of radiation, a controlled moisture could be maintained. The trouble was that no radioactive source could be found which would not be harmful to the person using it.

Speed recording and control for stretch and tension have been made much simpler with the advent of the pneumatic speed transmitter. This device, requiring only a simple pressure gauge or recorder to receive the rpm signal, permits an extensive use of speed measurements in ways not previously possible or practical.

Temperature is still the most common of all measurements in drying of textiles. In some cases, pressure control is used as a less expensive alternate. However, in either case, automatic control is of utmost necessity and only the *best* controller is good enough, considering today's production requirements. It is interesting to note that temperature can be used under certain conditions as a guide to moisture, or at least to provide a production and efficiency record of the drying operation.

Heatsetting of synthetic fabrics has created certain instrumentation problems. However, for the direct contact, cylinder-type heatsetting machine, such as built by National Dryer Company and others, there is an excellent instrument available. The roll-surface temperature is accurately measured by means of a temperature element which rides on the surface of the roll without scratching or marring. When roll temperature varies beyond the desired set limits on the instrument, an alarm sounds and the machine is shut down or run out until the condition is corrected. One finishing plant, which has a great deal of instrumentation, recently made the statement that this particular unit was the most valuable in their plant, having paid for itself many times over.

There is still an instrument problem for air-type heatsetting machines, such as made by Proctor & Schwartz and others. The air temperature can be measured, but it is very difficult to measure the cloth temperature because of the danger of marking off. There is, however, an optical type device by which the cloth temperature can be measured visually, and we are told that this has been successful under certain conditions (5).

Viscosity recording and control of

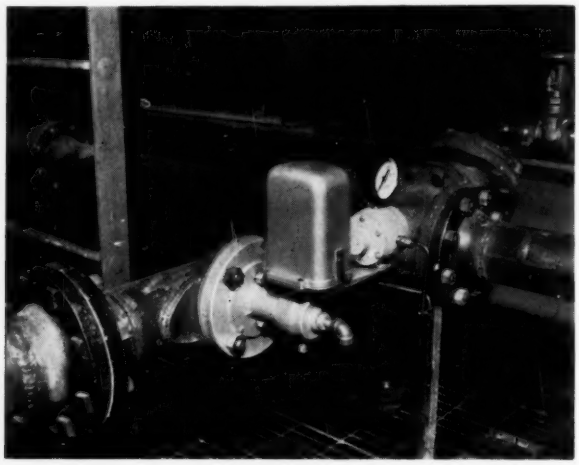

Figure 3
Excellent installation of Type 13FA level transmitter for continuous monitoring of 10,000-gallon latex storage tanks.

coating or bonding of textile materials can be most important. We now have proven industrially continuous measurement and control systems for these applications. One mill is currently using viscosity to control the pickup of coating material. By increasing the viscosity, the pickup is increased. The mill is able to duplicate the pickup or finish desired on future runs by maintaining the same viscosity used previously. (See Figure 2).

BLEACHING —— Instrumentation has been quite generally accepted as necessary for continuous bleaching of cotton cloth. However, the degree to which an individual mill acquires these benefits still depends pretty much on available funds.

Many of the operations are, of course, similar to those of the continuous washing and finishing ranges. At present, controlled flows of hot water to the washers are being ratioed to cloth production. However, there is a possibility that, before long, a measurement of the cleanliness of the water leaving the washer may be available. From this measurement, it will then be easy to automatically control the hot water input to the washer.

One very important instrument measurement is still not available for a continuous bleaching range. At present, there is no way to continuously measure the concentration of hydrogen peroxide in the cloth saturator. As a result, titrations have to be taken every fifteen minutes and manual corrections made.

The problem of perfecting this measurement is being worked out by instrument makers. As soon as it becomes available, this instrumentation will assuredly be used throughout the industry on continuous bleaching, eliminating the bothersome and costly intermittent titration.

MISCELLANEOUS —— The use of sodium hypochlorite in continuous hydrogen-peroxide bleaching helped emphasize another instrumentation problem. Until recently, it has not been possible to measure or automatically control the strength of the hypochlorite bath, usually about two grams per liter of available chlorine. Furthermore, there has not even been a quick and accurate way of titrating to determine the strength of this solution. But, after many months of trial operation and testing in the field, a simple and satisfactory method of continuous measurement and control for this bath has been developed. However, the installation must be carefully carried out because of the corrosive nature of the fluid.

Handling of acids and alkalis has been greatly improved by instrumentation. This applies to the hazard to personnel as well as the expense in the use of these chemicals. Many mill workers have been badly hurt or burned handling dangerous chemicals.

Mills have found, to their surprise, that buying bulk chemicals, even in small quantities, results in a considerable saving over those purchased in carboy lots. One mill found that the savings from buying sulfuric acid in bulk quantities of 250 gallons at a time gave them sufficient return to justify the investment in automatic instrumentation on the basis of chemical cost alone. The strong acid was fed directly from the bulk container into the process under completely automatic control, with safety alarms.

Many of you, it is safe to say, are weighing concentrated chemicals in pails in preparation for later dilution for dyeing or finishing applications. Where any one chemical is used consistently, complete automatic control of dilution and quantity draw-off can be easily justified.

Again, for storage tank inventory of chemicals from heavy latex compounds to lighter chemicals, the difficult and time-consuming job of "sticking" the tanks is completely eliminated by remote indicating and recording level devices of proper design. Here, too, installation details are most important to obtain proper results. (See Figure 3).

SUMMARY

The preceding discussion, plus the photographs of actual installations, should be ample proof that instruments definitely are an integral part of dyeing and finishing operations. Savings in chemicals, steam, water, and power alone are usually more than enough to justify their use. Improvement in quality and uniformity is certainly of far greater worth to the mill, even though the nature of such benefits is more intangible than dollar savings. To take full advantage of both the new and the proven instruments is a challenge which the textile industry should accept.

CONCLUSION

By having a better understanding of how instruments are becoming an integral part of your operations, it is hoped that more consideration will be given to instrumentation when reviewing your process operations. You, the user, will gain much and lose nothing by consulting the instrument maker along with the chemical supplier and the machinery maker. The instrument maker wants and needs this co-operation to give you the benefits of equipment completely integrated with instruments.

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Metropolitan Section———

PRACTICAL EXPERIENCE WITH THE PAD-ROLL DYEING MACHINE*

PANEL

FRANK J PERCARPIO
President
Northern Dyeing Corp

ROBERT M LESH
Superintendent
Northern Dyeing Corp

JOHN S THACKRAH
Technical Demonstrator
E I duPont de Nemours & Co, Inc

Details of the operation and results obtained with the Pad-Roll Dyeing System at Northern Dyeing Corp, Washington, NJ, are presented. The equipment, which is made in Sweden by AB Svenska Textilmaskinfabriken and sold in this country through Ernest L Frankl Associates, has been in operation at Northern Dyeing Corp for more than two years.

FRANK J PERCARPIO: After two years of successful operation of the Pad-Roll Dyeing machine in our plant in Washington, NJ, and having done more research, development and actual dyeing than any other installation in the world, we feel qualified and will endeavor to illustrate the economies of its operation. Robert M Lesh will give you the technical aspects of the unit, while John Thackrah, technical demonstrator for DuPont, will present some of his views on this method of dyeing.

Although Bertil Mellbin, the inventor of the machine, discussed it at the 1955 AATCC National Convention at Atlantic City *(1)*, there were no machines in this country at that time. Consequently, the practical value of the machine was not immediately realized by the American observers.

Two major factors greatly influenced our decision to purchase the (pad-roll) machine. The most important factor was the ever-rising cost of labor, dyestuffs and chemicals. The second factor was our need to become more versatile. The rising cost of labor and materials proved to be extremely critical in that it was not accompanied by a corresponding rise in finished goods prices. On the contrary, dyeing and finishing prices have remained far too stagnant for a long time.

To emphasize the versatility of the pad-roll machine, I need only cite our own specific case. Two years ago, we could have been regarded as a specialty dyeing and finishing plant, 80 percent of our work being processing of rayon and cotton fibers. Since the introduction of the pad-roll, we have done production dyeing of dacron, nylon, Orlon and blends, as well as many other difficult fibers.

In order to evaluate the pad-roll machine before purchasing it, I traveled to Sweden. There, I visited three of the largest plants in the country, each with a pad-roll installation. I was surprised to find that these plants utilized the machine for desizing and chlorite bleaching, as well as dyeing *(2)*. After running some trials on our cloth in Sweden, we decided to purchase the machine. After only two months of operation, we were convinced that the pad-roll could reduce our labor and dyestuff cost, while turning our a very superior job.

Prior to the installation, our dyehouse consisted of 12 jigs, working two eight- or 10-hour shifts. The pad-roll introduction was such that the entire second shift and the second shift dyer was eliminated. It was not our aim to greatly increase production with this machine but rather to produce a superior job in a more efficient manner.

I personally feel that prices should not be immediately lowered just because the producer can do the job more efficiently. The great amount of price cutting in our industry makes for instability, while depriving a good number of dyers of a legitimate profit.

I might point out that the pad-roll is by no means an easily installed cure-all. Every production dyeing takes meticulous and accurate laboratory preparation, because there is no adding or subtracting of the dyeing after starting. The pad-roll requires a very close, personal touch, in that everything from the laboratory formulation to actual machine operation requires the strictest adherence to procedure. For these reasons, it would be unrealistic to expect immediate results in a plant where such painstaking attention to details might be lacking. This has been proven in several large plants where, because this kind of supervision was not present, the pad-roll never realized its potential.

In concluding, I should like to state once again that the wisest course for a dyer or finisher in today's ever-changing, tough market, is to refrain from irrational price cutting. If the profits gained from more efficient operation are reinvested in new, modern equipment, I honestly feel that all concerned will be better off. Thank you.

* * *

ROBERT M LESH: Tonight I am deeply honored to be able to stand before you and discuss our experience with the pad-roll machine. We have operated our unit since the first day it was set up on an almost continuous basis, and a good estimate would be that at least 10,000,000 yards have been successfully produced by this method. Much has been already published about the

* A symposium held April 10, 1959 at a meeting of the Metropolitan Section held at Kohler's Swiss Chalet, Rochelle Park, NJ, with P J Fynn as moderator.

principle of this machine (*1, 2*), but it is perhaps not out of place to describe the process again in outline.

There are three phases which take place in any conventional dyeing. These three phases are:

a) the diffusion of the dyes throughout the water;

b) the adsorption of the dyestuff onto the surface of the fibers; and

c) the step which requires the longest time, the diffusion or absorption of the dyestuff into the interior of the fibers themselves.

This absorption or diffusion into the fibers is a slow process, taking from one to six hours, and sometimes eight, depending on the shade, to reach equilibrium. The rate of diffusion is dependent upon the particle size of the dye molecule; the degree of aggregation of the dyestuffs; the kinetic energy of the system, which is governed by the temperature of the type of fiber to be dyed; and the construction of the fabric.

Although many of us are versed in the use of pad-jig or pad-beck techniques and fixing in a heavy salt bath or by an aging process, it is generally recognized that optimum fastness can not always be obtained. Shading can occur in salting processes, shades must occasionally be topped up, and often a tailing condition or a back-and-face condition can occur.

For a dyestuff to have optimum wetfastness, its molecules must diffuse into the innermost fibers in such a way that the distribution is even throughout the entire cross section of the fiber, and complete equilibrium must exist. To accomplish this, it is necessary to keep the dye-impregnated fabric at a predetermined temperature and humidity for the time necessary to obtain this equilibrium.

Since, by the padding method, using a two-tank supply system, no time is needed for the make-up of the color and diffusion throughout the water, phase "a" is completely eliminated, and, since the actual padding operation itself takes place at a speed of 80 yards per minute, in effect eliminating phase "b" because almost instantaneous adsorption onto the fiber surface takes place at an ideal water-to-cloth ratio of 0.7 or 0.8 to 1.00, a padding technique can be seen to be ideal for level, even adsorption, and a labor saving can be achieved.

From an evenly padded, adsorbed fabric, it is then necessary to maintain theoretical conditions in order to promote the complete diffusion of the dyestuffs into the inner core and throughout the fibers. This is the third phase (c), which we discussed. These conditions, which constitute the ideal situation, are achieved by the pad-roll dyeing machine. The Swedish engineers designed a hermetically sealed chamber into which the cloth could be placed. Experimentation showed that, if the wet-bulb temperature was maintained close to the dry-bulb temperature, the padded dyestuff would remain in solution or dispersion and in the identical fluid state in which it was padded until the diffusion was complete. This sealed chamber is mounted on wheels, and can be removed from the padding unit and stored until such time as the dyeing is complete. Meanwhile, another chamber can be filled, and so on, making the system, for all practical purposes, a semicontinuous, batchwise, dyeing method. This, of course, eliminates the cost of labor for the time needed for diffusion, and therefore the third phase (c) is practically eliminated. Therefore the economics of such a system, if practical, can be seen readily.

A brief description of the machine is next in order. The basic padding unit consists of two 220-gallon storage tanks containing an open steam coil as well as a closed steam coil with a temperature measuring and controlling device which operates in the recirculation line. The padding liquor is fed from the storage tanks by means of a bubble-type liquid level controller to a very small steam-jacketed padder pan containing a displacement chamber similar to that used in a Williams unit. The padder pan is deep, allowing for a long passage in order that the fabrics can swell and so that any variations in padded speed will have a minimum effect on pickup. The volume of liquor held by the pad tank is only four gallons, and there is a temperature-measuring device and controller to maintain the temperature of the pad liquor exactly the same as the temperature of the storage tanks. The small volume of the pad pan also minimizes the chance of encountering substantivity effects. The padder rolls themselves are of very large diameter, of natural rubber, without any crown, and operate at five kg/cm^2.

Following the padding operation, the cloth passes over a compensator, which controls the speed of the batching chamber, and then passes through an infra-red zone, which consists of a series of 18 quartz tubes designed to raise the cloth temperature to the temperature of the batching chamber. The purpose of this is to prevent any condensation of the moisture in the saturated chamber on relatively colder cloth. Padding temperatures are always lower than chamber temperatures.

The second part of the machine is the transportable chamber, which I call the diffusion chamber. This chamber is on three wheels, is easily maneuverable, and can accommodate anywhere from 4000 yards of a heavy fabric to 12,000 yards of a light fabric. It is completely insulated, the floor is heated, the ceiling is heated, and the entering slot is heated. There is a dry-bulb and a wet-bulb temperature recorder and controller. The entire chamber is operated electrically, with the exception of the insertion of dry steam prior to the start of a dyeing. Cloth is wound upon a two-foot-diameter batch roll inside the chamber, and when the chamber is full, the roll will be roughly six feet in diameter. There is a small turning motor to keep the roll in constant rotation while allowing time for diffusion. When the chamber is backed into position behind the infra-red zone, it is locked in position and sealed to the infra-red zone. During this part of the padding operation, the chamber batching roll is rotated by a separate drive controlled by the compensating roller between the infra-red zone and the padder.

The completed dyeing is removed from the chamber by unrolling it in the same way that the cloth entered; it is then given a padder-dip rinse and a suction and then dried. This is true of all dyeings except those done with fiber-reactive dyes, which of course, require an afterwash.

With respect to dyes suitable for pad-roll application, the most important factor is that of dye solubility or dispersibility. For direct dyeings, the dyes must be soluble enough in order to be padded in the soluble state. They should contain as little electrolyte as possible, and should have as small a degree of aggregation as possible. However, one may use successfully any of the dyestuffs which are suitable for conventional padding methods provided the solubility requirement is met.

Acid dyestuffs are usually good; however, even here we have encountered some solubility problems. Disperse dyes must, of course, be finely dispersed, and must be stable for at least four hours.

Dye costs resulting from the pad-roll method are generally lower since the only waste is the four gallons needed to fill the pad pan, which remains after the dyeing. Therefore, there is about 96% utilization of the

pad liquor. However, in some cases where the solubility of a dyestuff is a factor, it may be necessary to use a more expensive dyestuff than would normally be used.

Laboratory matching involves a technique that is an exact duplicate of the operation of the production machine. The padder, which is furnished, is made to duplicate the production machine, and an oven is furnished to be used for conditioning the laboratory samples. The laboratory technician pads a sample of cloth through the padder at the same pressure that will be used on the production machine, rolls it up on a tube, seals it hermetically with aluminum foil, and stands it on end in the conditioning oven for anywhere from two hours to six hours. When the sample is removed from the oven, it is rinsed in warm water. If it shows any degree of bleeding, then the next dyeing is left in longer, since it is evident that the diffusion was not complete.

Laboratory matching is very difficult for several reasons. First of all, the length of time it takes before full diffusion has taken place makes it difficult to get an exact match in less than two or three days. Secondly, the laboratory work must be very accurate, since the laboratory formula is expanded from a fifty-milliliter solution to 800 liters on the production machine. Third, the laboratory match must predict exactly the shade change with finish, heat-setting, calendering, and any other operations which may affect the final shade. Fourth, every fabric and every shade is a distinctly separate entity, demanding extreme care in formulating.

To date we have been successful in the dyeing of most fabrics that have sufficient pickup or carrying power to pad evenly and run smoothly. We have been successful in the dyeing of Orlon, nylon, Dacron, Arnel, acetate, silk, flax, Verel, Topel, Dynel, viscose, and Bemberg, primarily in blends with cotton, although many have been successfully dyed by themselves.

However, do not let this impressive list of fibers give you the idea that this machine is the answer to all types of dyeing and all types of fabrics. Sheers, lightweight fabrics, especially in the 100% hydrophobic fiber group, and particularly in filament constructions, present serious research and development problems.

(At this point, Mr Lesh called attention to samples of various dyeings produced on the pad-roll machine, stating that no production lot was smaller than 4000 yards. All-viscose fabrics with a Mylar thread dyed with directs, soluble vats, and fiber-reactive dyes were displayed. Bemberg-cottons dyed with direct colors, and rayon and cotton failles were shown. Of special interest were Dacron/cotton fabrics in union shades, acetate/cotton and nylon/cotton fabrics cross-dyed in irridescent shades. Finally, a complete range of fiber-reactive dyes on Belgian linen were shown.)

* * *

JOHN S THACKRAH: Mr Percarpio and Mr Lesh invited me to be a member of this panel in order that I might describe to you the advantages and disadvantages of pad-roll dyeing that I have observed in working with the people at Northern Dyeing Corporation for the past few years.

The first, and probably most important, advantage noted is the economy of the operation. Labor, which is a very high-cost item today, is utilized to maximum advantage. Two men can handle the entire operation. Using five chambers and by padding at 80 yards per minute, they can dye 35,000 yards during a a 12-hour day. This amounts to 7,000 yards per chamber per day.

Minimum quantities of steam and water are used. The padding operation and the insulated chamber, which requires little or no injection of steam to maintain proper dyeing conditions after loading, are responsible for this. As for color yield, I think 90% fixation would be a good estimate of efficiency. In many cases I have observed no washdown after dyeing. There is very little waste of padding liquor since the amount required can be calculated based on the known pickup and yardage involved. In many instances, the residual liquor to be discarded amounted to no more than four gallons. Alternatively, this residual liquor can be retained for future use if adequate stability of the dyes involved has been established.

According to the plant engineer at Northern Dyeing, maintenance cost of the pad-roll unit is very low. This is another important economic consideration.

A second advantage is that fabrics are handled on a roll in the open width without tension. This factor minimizes distortion and insures optimum hand in the finished fabrics.

A third advantage is the very good penetration in fabrics of tight construction. Mr. Lesh has shown me some cross-sections which indicate good fiber penetration of cellulosics with direct dyes. Nylon or Dacron polyester fiber fabrics, dyed with acid or disperse dyes respectively, also show good penetration and levelness.

A final advantage of the pad-roll machine is its versatility, which, in today's ever-changing market, is very important. A wide variety of fibers—including wool, cotton, rayon, acetate, Arnel, Verel, Dacron, Orlon acrylic fiber, and nylon—have been dyed successfully either individually or in blends. However, I would like to point out that, when working with blended fabrics, one-bath pad techniques must be developed in order to capitalize on the economies mentioned earlier.

Turning to the disadvantages, the subject just mentioned—that of dyeing blended fabrics which must be cross or union dyed from one-bath pad—can be difficult and, in some cases, almost impossible. Shade control and compatibility of the dyes involved are important considerations.

Another disadvantage is shade matching. Based on previous experience, laboratory shade matching is difficult in the sense that it requires up to five hours for each approximation. This allows only one or two approximations of a given shade per day. In addition, laboratory matches must be exact since it is this formulation which will dictate the success of the plant operation. No adds or corrections can be made during dyeing; therefore the importance of laboratory control is self evident. This control factor follows right down the line from fabric preparation to color make-up and padding, if duplication of laboratory results is to be expected.

A final disadvantage which must be taken into consideration is redyeing. As mentioned earlier, each chamber holds about 7,000 yards of fabric. If, for any reason, a problem should arise, particularly with blends of the newer synthetics, this substantial yardage would have to be reprocessed by appropriate corrective procedures. Fortunately, few problems of this nature have been encountered to date.

Taking all factors into consideration, we believe the advantages of the pad-roll system far outweigh the disadvantages and that this relatively new method of dyeing is an important contribution to the industry.

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PROGRAM FOR LADIES ATTENDING 1959 AATCC NATIONAL CONVENTION

ESTHER L BATCHELDER, chairman, Ladies' Program, 1959 AATCC National Convention, and her Committee, have planned a most interesting and stimulating program for all the ladies attending this year's Convention in Washington, DC, October 8-10.

A formal invitation to the wives to attend the ladies' function and other activities of the 1959 National Convention was sent in the first mailing to AATCC members along with registration blanks and other pertinent information of interest to those planning to attend this year's Convention and exhibitions at the Sheraton-Park and Shoreham Hotels in Washington. Dr Batchelder and her Committee will assist the ladies in getting acquainted and arranging tours and other activities of special interest to the ladies.

The tentative Ladies' Program is shown below:

Thursday, October 8

Hospitality Room, Park Sheraton Hotel, open 8 AM to 4:30 PM.

Conducted tour of the city of Washington, DC, 10:00 AM to 1:00 PM.

Free time for lunch, shopping, sightseeing, or visiting in the Hospitality Room.

Friday, October 9

Hospitality Room, Park Sheraton Hotel, open 8 AM to 4:30 PM.

Visit to the White House, 9:30 to 10.15 AM.

Get-acquainted luncheon and Fashion Show, Shoreham Hotel, 12:30 to 2:30 PM.

Free time for shopping, sightseeing, or visiting in the Hospitality Room.

Hostesses will be present on both Thursday and Friday in the Hospitality Room to assist the visiting ladies. Information concerning tours and other tourist attractions also will be available in the Hospitality Room.

Registration fee of $7.00 covers refreshments in Hospitality Room and activities listed in the above program.

It is requested that those who contemplate attending the Washington meeting advise Dr Batchelder, director, Clothing and Housing Research Division, ARS, USDA, Agricultural Research Center, Room 224, Center Building, Beltsville, Md, on the forms that have been provided in the regular mailing of Convention notices to all members. Those who have not received such a form for ladies program registration, should write to Dr Batchelder giving your name and address and telling her that you plan to attend the 1959 Convention of the AATCC in Washington, DC, October 8-10, 1959.

ESTHER L BATCHELDER
Chairman
Ladies Program
1959 AATCC Convention

Other members of the Ladies' Program Committee and their addresses are as follows:

Elinor Davis, Harris Research Laboratories, Inc, 6220 Kansas Avenue, NE, Washington 11, DC.

Florence Forziati, National Bureau of Standards, Connecticut Ave at Van Ness St, Washington, DC.

Ruth Howorth, American Chemical Society, 1155 16th Street, NW, Washington 6, DC.

Alice Linn, Federal Extension Service, US Department of Agriculture, 5438 South Agriculture Building, Washington 25, DC.

Dorothy Lyle, National Institute of Drycleaning, 909 Burlington Ave, Silver Spring, Md.

Faye Mitchell, College of Home Economics, Univ of Maryland, College Park, Md.

Marjorie Molloy, Federal Trade Commission, Pennsylvania Ave at 6th St, NW, Washington 25, DC.

Dorothy Nickerson, Agricultural Marketing Service, US Department of Agriculture, Room 604 Annex, South Building, Washington 25, DC.

The following is a list of wives of members of the Washington and other Sections, who have agreed to help Dr Batchelder's Committee:

Washington Section

Mrs William D Appel, 9101 Jones Mill Rd, Chevy Chase, Md.

Mrs Edmund M Buras Jr, 10107 Kinros Ave, Silver Spring, Md.

Mrs Robert T Graham, 2808 Newton, Silver Spring, Md.

Mrs Arnold M Sookne, 9208 Saybrook Ave, Silver Spring, Md.

Mrs Lyman E Fourt, 5510 Johnson Ave, Bethesda, Md.

Mrs Louis R Mizell, 5611 Newington Rd, Springfield, Md.

Mrs J R Wiebush, 1530 Red Oak Dr, Silver Spring, Md.

Delaware Valley Section

Mrs Thomas H Hart, 1136 Magee Ave, Philadelphia 11, Pa.

Mrs Frederick V Traut, 117 Rhoads Ave, Haddonfield, NJ.

Mid-West Section

Mrs Joseph H Jones, 6836 Wallings Rd, Brecksville, Ohio.

Niagara Frontier Section

Mrs William H Leyking, 291 Glencove Rd, Buffalo 23, NY.

Mrs Kenneth A Lister, 92 King St East, P O Box 236, Hamilton, Ont, Canada.

Piedmont Section

Mrs Warren E Rixon, 1500 Cyrus Rd, Charlotte, NC.

Mrs Joseph C King, 107 Holly Dr, Spartanburg, SC.

Mrs Richard E Rettew, Davidson Rd, Rt 7, Greenville, SC.

Rhode Island Section

Mrs W G Parks, 30 Lower College Rd, Kingston, RI.

South Central Section

Mrs Edwin F Jurczak, 4619 Murray Hills Dr, Chattanooga, Tenn.

Southeastern Section

Mrs Robert B Hallowell, 1600 Forrest Lane, Albany, Ga.

Elected Members

JULY 15, 1959

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
* indicates transfer from another class of membership

RHODE ISLAND
Charles J Bolger

METROPOLITAN
Eugene J Steiner
Lawrence S Boss (J)
William J Urban (J)
Rahmat Ali*

NIAGARA FRONTIER
Peter M Crosby (J)

DELAWARE VALLEY
Michael J Miller*

PIEDMONT
Reginald W Biggers
Joseph N LeConte
Albert M Thorne
Eugene P Van Kerckhove
John F Fowler III (A)
Walter Baumann*
Don C Duggan*

SOUTHEASTERN
Harry F Taylor

MID-WEST
Lilliam O Lund

LOWELL TECHNOLOGICAL INSTITUTE STUDENT CHAPTER
S Soetopo (S)

UNCLASSIFIED
Erneste A Hanhausen
Ernesto G Diederichsen (A)

Membership Applications

RHODE ISLAND
Transfer from Student to Junior

Leonard G Alves—Science teacher, chemist, Fall River Public School, Henry Lord Junior High School, Fall River, Mass.

Thomas A Brown—Tester of textile products, Arkwright Finishing Co, Fall River, Mass.

Arthur W Godfrey Jr — Graduate student, Providence College, Providence, RI.

Anthony P Vellucci—United States Air Force.

METROPOLITAN
Senior

Torben E Neesby — Consultant, Boonton, NJ. Sponsors: J P Redston, G M Kidder.

Junior

Robert L Harte — Tex chemist, Nopco Chemical Co, Harrison, NJ. Sponsors: J F Cairns, R G Schaubhut.

PIEDMONT
Junior

James E Gregson—Chemist trainee, Dan River Mills, Inc, Danville, Va. Sponsors: N R Hall, H H Taylor.

Associate

Everett C Eldredge—Chief chemist, General Latex & Chemical Corp of NC, Charlotte, NC.

Transfer from Student to Junior

Daniel D Ward—Chemist, Product Dev Labs, Celanese Corp of America, Charlotte, NC.

Alan D Grover—Dev chemist, Excelsior Finishing Plant, Pendleton, SC.

SOUTHEASTERN
Senior

Fred E Royal—Towel dev mgr, Fairfax Mill Div, West Point Mfg Co, Fairfax, Ala. Sponsors: W T Brown, K E Miller.

Associate

Florine K Rasch — Asst professor, textile & clothing, Florence State College, Florence, Ala.

MID-WEST
Transfer from Associate to Senior

Joseph A Roux — Textile chemist, Emery Industries Inc, Cincinnati, Ohio. Sponsors: H T Buckley, L M Wise.

PACIFIC SOUTHWEST
Associate

James S Martin — Manager, West Coast sales, Naftone Inc, Rep Verona Dyestuffs, San Francisco, Cal.

NNE Outing Date Changed

The date of the 1959 Outing of the Northern New England Section has been changed from Sept 18 to Sept 25.

The site of the affair, Wachusett Country Club, West Boylston, Mass, remains the same.

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES
Sept 10-11 (Hotel McAlpin, New York, NY); Sept 10—Council Committees and Research Committees; Sept 11 (AM)—ECR, TCR; Sept 11 (PM)—Council

NATIONAL CONVENTIONS
Oct 7-10, 1959 (Sheraton Park and Shoreham Hotels, Washington, DC); Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa); September 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

DELAWARE VALLEY SECTION
Sept 18 (Reading, Pa); Oct 23 (Kugler's Restaurant), Philadelphia, Pa.

MID-WEST SECTION
Oct 24 (Bismarck Hotel, Chicago, Ill)

NIAGARA FRONTIER SECTION
Sept 25 (Niagara Falls, Ont, Canada); Dec 11 (Annual business meeting, Buffalo, NY)

NORTHERN NEW ENGLAND SECTION
Sept 25 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 16 (Lexington Inn, Lexington, Mass); Dec 4 (Joint symposium with ASME Textile Engineering Div, Smith House, Cambridge, Mass); Jan 15 (Woodlawn Golf Club, Newton, Mass)

PIEDMONT SECTION
Sept 25-26 (Barringer Hotel, Charlotte, NC); Jan 22-23 (Poinsett Hotel, Greenville, SC); April 2-3 (Hotel Robert E Lee, Winston-Salem, NC); June 3-4 (Outing—Ocean Forest Hotel, Myrtle Beach, SC); Sept 23-24, 1960 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION
Sept 18 (Management Night); Oct 23 (Prov Eng Soc, Providence, RI); Dec 4 (Annual Meeting—Johnson's Hummocks Grille, Providence, RI)

SOUTH CENTRAL SECTION
Sept 19 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION
Sept 12 (Ida Cason Callaway Gardens, Pine Mtn, Ga); Dec 5 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
Sept 25 (Blake's Restaurant, Springfield, Mass); Oct 23 (Annual Meeting—Rapp's Restaurant, Shelton, Conn); Dec 4 (Hartford, Conn)

Activities of the Local Sections

Piedmont

PIEDMONT Section held its 1959 Annual Summer Outing at the Grove Park Inn, Asheville, NC, June 5 and 6 with 484 members, wives, and guests attending.

The two-day event included a full program of activities including golf, horseshoe pitching, swimming, shuffleboard, putting, bingo and cards.

Friday daytime activities included golfing at the Asheville Country Club, horseshoe pitching, swimming, shuffleboard, and cards. Friday evening was highlighted by a buffet dinner preceded by a social hour with an informal dance in the evening with music furnished by Fritz Albertson.

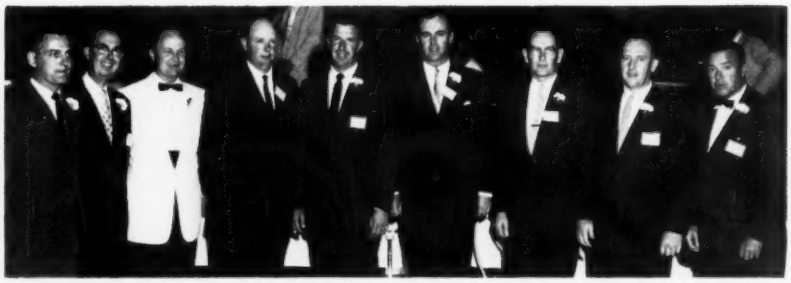
The annual golf tournament highlighted Saturday's activity with 174 participants registered. Winner of the tournament and recipient of the E J Feeley Low Gross Trophy was Gordon Eaves with a 73. Other winners in the golf tournament were as follows:

Low Gross:	
Howard Carpenter	74
Bishop Smith	75
Heath Alexander	75
Carroll Martin	79
Ben Caskey	79
Bruce Bishop	80
Pinkey Gardner	80
Dick Randleman	80
Carl Seldon	81
Bill Barineau	83
Jim Morton	84
Fred Phil	84
Bob Ward	86
Callaway Event:	
Ralph Elwell	68
Troy Lanning	70
Walter Morris	71
Jim Radcliffe	71
Ed Feeley	71
Bill Grottle	71
Paul McGinty	72
Oliver Goldstein	72
Dave Fillippeli	72
Paul Wood	73
Robert Payet	73
Ray Ward	73
George Clendon	73
John Baswell	74
Ladies Low Gross:	
Mrs Richard Randleman	79
Mrs Heath Alexander	86
Mrs Carroll Martin	97
Mrs Troy Lanning	98
Mrs Ben Caskey	103
Ladies Callaway Event:	
Mrs H A Turner	70
Mrs E J Feeley	72
Mrs Ira Hurd	73
Mrs C E Gibson	75
Mrs G A Mervin	77

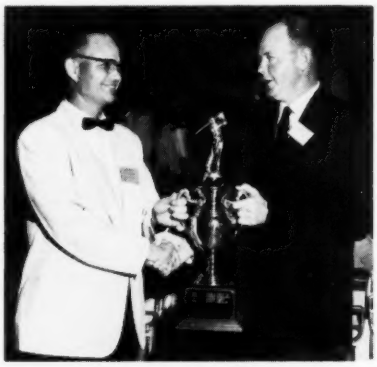
Saturday morning, many of the ladies participated in bingo. This was followed by a ladies luncheon and a well-attended bridge and canasta party in the afternoon. Shuffleboard, horseshoe pitching and putting contests were also held on Saturday.

The outing was concluded with a social hour followed by a banquet in the Plantation Ballroom, and a semi-formal dance. The only business transaction was the recommendations of the Nominating Committee presented at the banquet.

C E Gibson, Dow Corning Corp, served as chairman of the Outing. He was assisted by E P Lavoie, Stein-Hall & Co, Inc; C F Martin Jr and E J Feeley, E J Feeley Co, Inc; E P Henley, Crown Chemical Corp; W A Colby, Emery Industries, Inc; P D Cunningham, Glyco Products Corp; and D A Torrence Jr, Ciba Co Inc. D R Greene, Nyanza Color & Chemical Co, Inc was social chairman.



PIEDMONT SECTION OUTING COMMITTEE (l to r): P D Cunningham, W A Colby, D R Greene, C F Martin Jr, C E Gibson, E J Feeley II, D A Torrence Jr, E P Henley, E P Lavoie



Gordon Eaves (left), Cloverdale Dye Works, receives E J Feeley Low Gross Trophy from C F Martin Jr, E J Feeley Co, Inc

L to r: Richard E Rettew, Polymer Southern, Piedmont Section secretary; Joseph C King, Metro-Atlantic, Inc, Piedmont Section chairman; and E P Lavoie, Stein, Hall & Co, Inc, member of the Outing Committee

Western New England

ON Friday, June 19th, the Twelfth Annual Outing of the Western New England Section was held at the Wallingford Country Club, Wallingford, Conn.

Because of the inclement weather, the attendance of 60 members and guests was smaller than anticipated.

Prizes were awarded to the winners of the various golf events, and everyone who attended the outing received a door prize.

Mid-West

The 27th Annual Outing of the Mid-West Section was held June 12-13 at Brown's Lake Resort, Burlington, Wis.

Two-ball foursomes teed off on Friday afternoon at the Riverview Country Club, Waterford, Wis. The regular golf tournament was held at the Riverview Country Club on Saturday.

Other events included the traditional softball game between millmen and suppliers, horseshoe pitching and shuffleboard.

A cocktail party preceded the banquet and awards on Saturday evening.

Arrangements for the Outing were handled by the following Committee: Arthur C Teichner, *chairman*, William Boyd, James O'Malley, William Paine, George Chabot, Roger Carr, Frank Gurry, Richard Meuse, Leroy C Voss, Bernard Isenogle, James Whalen, George Willgeroth, and William Fischer.

Inter Alia—Inter Nos

JULY JUBILEE
1959

P J WOOD

SOUND

As we have frequently referred to ultrasonics and supersonics in our writings, we were more than ordinarily intrigued when a small booklet of 24 pages hopped from the void without, right onto our desk.

In the introduction it says . . . "if your preferences allow nothing more mathematical than page numbers, this is for you." That is where our preferences lie, so it was for us.

The writer of the thesis, whom Elmer would call a lulu for lucidity, describes sound as a rapid variation in atmospheric pressure, in its objective sense, and goes on to explain that, when this pressure variation reaches your ear, the reaction you experience is what you think of as sound.

In measuring sound, we are told, the term "sound pressure level" is commonly used, and the decibel, of which we have heard on radio and television, is the unit. By the construction of the word, we would imagine the decibel to be the tenth part of a bel, which must be something.

Evidently decibles do not add up like other entities, for we learn that when you add 70 decibels to 70 decibles, the answer is not 140 decibels, but 73 decibels.

The conclusion of the matter is that the sound pressure level, as determined by the sound-survey meter and expressed in decibels is related to loudness, and that frequency expressed in cycles per second, determines the pitch.

This small publication very effectively whets the appetite for a larger book mentioned, "Handbook of Noise Measurement", which costs only a dollar.

AMERICAN PLAN

In all our experiences with camels (or would one say "of camels"?), and we are bound to admit that our experience with camels has been rather limited, we do not remember any camel saying one solitary word when his or her (as the case might be) driver commanded him or her to lie down, which seems to be a habit with camels, when they have nothing better to do. BUT, when the command to arise and go forth is issued, the otherwise quiescent quadruped, of whom someone once wittily remarked, "he looks as if he had been designed and constructed by a committee", wails loud and long and lustily.

For this reason, we cannot understand why one of our pleasant playmates at lunchtime, whom we will call Al, partly because that happens to be his name, emits what appears to us to be the most anguished groan, on sitting down at the luncheon table; a groan second only in intensity to that of the unseen party of the first part on TV for whom an equally invisible party of the second part has just poured out a foaming glass of a well-known beverage.

And the funny thing about it is—we feel quite sure that Al, whose vocation is mainly mathematical and financial in the commercial field, sits down at his desk with what he is given to calling "Wim and Wigor" to attack the problems of his busy day.

We imagine that, unlike the aroused and vociferous camel, he approaches the tiresome job with suitable and becoming taciturnity and sticks to it until it is licked, like any other good American would.

CHOICE

When we get to feeling like bragging about our ancestors, we reflect that we had no part in picking them; no matter, this makes us even; the chances are that they wouldn't have chosen us for descendants.

FROM OUR INSTIGATORS, INCITERS, COUNTENANCERS, AND ENCOURAGERS

NEWEST STATE

Edmond Lutz, from faraway Hawaii, enquires when he may have the pleasure of seeing us over there, reminding us that from next July and on, the flying time from New York to Honolulu on the new jet planes will be reduced to only 10 hours. "Taking the difference of hours into consideration" says he, "you will be able to have breakfast in New York and luncheon in Waikiki and, believe me, the Island is beautiful and worthwhile visiting".

Merci beaucoup, cher ami, pour l'invitation. Nous verrons! Aloha!

Dr Lutz, since his retirement from Carbic, where he was technical director for many years, is now vice president of Alfred Shaheen Ltd making and printing those celebrated Surf'n'Sand Fabrics and evidently having a lot of fun doing it.

AND FROM ITALY

In a very recent letter, Walter M Scott complains that he is not learning Italian as fast as he would like to, as his studies are interrupted by trips to other countries. He has spent a week in each of three different countries. However, in a four-year tour of duty he should be able to pick up more than a respectable smattering of the language. He should be "blinking letter-perfect", as Elmer might say.

Says Dr Scott, to quote him exactly, "One advantage of being in Rome is that I get to see some of my textile friends who come to Europe for business or personal reasons. Sydney Cone, Leonard Smith and Sidney Edelstein are arriving at different periods during the next month, and several more, including Raphael (Dr Rupp) have said they expect to come over sometime during the next year. Why don't you plan a trip over here too? I would love to serve you an Italian meal in my Roman apartment. You would have a good opportunity to try out your knowledge of Italian".

HERE AT HOME

A short note from our friend-of-long-standing H M Chase asking for a little information sufficed to show that he is still interested in the same things that we are. We hope that he will find the Washington Convention of AATCC near enough that he will be able to attend. There will be many who will be glad to greet him. How about it, "HM"?

THIS SPENDING AGE

"Old Bill" in his column "Whimsical Whims" in the Shanco Messenger, which is the house-organ of Shanco Plastics, writes about this thus:

> "See where our Joint Chiefs of Staff down in DC are having their offices remodelled and refurnished——cost $350,000. If it's privacy or front the chiefs require, the sum should provide it".
>
> "Now I recall J P Morgan's office behind just a rail at Broad and Wall Streets and here some big and private deals. Frank Smithers, his office on Exchange Place was occupied by this banker and his four partners. His desk, an old roll top, at it the International Business Machines Corp and other enterprises were organized".
>
> "These chiefs did big things without elaborate staging, they sat out front instead of putting it on".

This is Old Bill's story, and we are struck with it.

EVENING PRAYER

Here is a prayer that can be used by Christians and Jews, and indeed by any and all who believe in a Supreme Being:

> "O Lord, support us all the day long, until the shadows lengthen and the evening comes, and the busy world is hushed, and the fever of life is over, and our work is done. Then in Thy mercy grant us a safe lodging, and a holy rest, and peace at the last. Amen".
>
> Book of Common Prayer
> Family Prayer, At Night QEF

Abstracts

Curtain Fabrics from Glass

Anon, *Textile Recorder* **76**, 68, Feb 1959

While glass fabrics offer important advantages over other types of materials for certain uses, their processing involves many technical problems not encountered when dealing with normal textile fabrics.

Although the glass yarn is extremely strong, its extensibility is very low (about 2% at break); the yarn is very brittle and cannot be knotted successfully. In finishing it is extremely difficult to obtain an adequate handle.

Some of the advantages claimed for glass curtains are that they cannot burn, do not absorb dirt, are very easily washed and dry quickly. No ironing is necessary, and the fabrics do not shrink, sag or stretch. Crease resistance is high. Glass fibers are unaffected by sunlight, atmospheric conditions. moths or mildew. The dyes now being employed in dyeing and printing are said to be extremely fast to light.

On the other hand, the fabrics have only moderate abrasion resistance, which does not affect their use as curtains but interferes with other textile applications. The sp gr of glass is high (2.5-2.7) and the fabrics are therefore relatively heavy.

The first finishing process for glass fabrics after weaving consists of "heat-cleaning" by passage between banks of electric elements to remove impurities such as size and oil. The heat is sufficient not only to burn out all these impurities and leave only a pure glass, but also to heat-set the fabric and weave completely. The materials are then prepared for coloration by coating the fibers with a synthetic resin to which the conventional dyes can be chemically linked. Dyeing or screen printing follows, after which the decorated material is dried and baked. The final processes involve the application of fixing and proofing resins which protect the yarns and colors, and which impart crease and dirt resistance. A final washing completes the treatment.

Tips on Printing with Metallic Powders

Mackay, M, *Textile World* **109**, 73, 75, June 1959

Bright, sharp patterns can be printed with metallic powders if the usual procedure is modified to suit the peculiarities of these materials Cloth preparation is generally the same as for any other style of printing, but some plants calender the fabric before printing in order to present a flatter surface that will retard penetration of the metallic particles.

Binders for metallic powders are all based on resins that are cured to fix the metallic component on the fabric. They include mixtures of ethylcellulose as a carrier, a melamine resin to improve washfastness, and an acrylic resin.

The ideal binder should dry fairly quickly, but not so fast as to cause the metallic mix to dry on the print roller and clog up the engraving.

Water-in-oil binders are generally satisfactory. Oil-in-water binders are very good, but they do not have the printing qualities of nonsolvent types. They are more difficult to lubricate and tend to streak and stick to the print roller.

The most satisfactory mesh sizes of the metallic powders will pass through screens of 285 to 325 meshes per inch. Smaller particles do not bind well, and larger ones have inferior light-reflecting qualities.

It is good practice to mix only enough metallic-print formulas to last two to three hours.

Straight copper rollers give better coverage than chromium-plated rollers, and the metallic powders do not scratch the copper. The copper surface appears to give better adhesion of color than the very slick chromium plating.

How Fiber Structure Affects Cotton Processing

Campbell, K S, *Textile World* **109**, 83, 85, May, 1959

Native cotton is made up of chains of molecules that consist of about 3500 anhydro-glucose units. The molecular weight is approximately 570,000. Cotton cellulose is a strong fiber because its macromolecules are long, and there are therefore great possibilities of action between the many cohesive forces of neighboring chains. The principal force that binds the macromolecules together is the hydrogen bond.

The cotton fiber can be dissolved by immersion in cuprammonium hydroxide or cupri-ethylenediamine. These substances break the hydrogen bonds and introduce ionic groups that speed up solubilization.

Normal cotton dissolves in these solutions to produce a liquid of a certain viscosity. An equal weight of degraded cotton, damaged by some form of chemical treatment, will produce a solution of lower viscosity because some of the hydrogen bonds were destroyed. Analytical procedures based on this phenomenon are very useful in determining the extent of degradation of the fiber at any stage of processing.

The cotton fiber contains both amorphous and crystalline areas, as shown by x-ray examination. Only the amorphous regions can be penetrated by water or aqueous solutions. In an average cotton fiber these open spaces occupy 30-40% of the total volume of fiber. The efficiency of any processing treatment of cotton is determined largely by the intermolecular, intermicellar, and interfibrillar spaces in the fiber, because the entry and diffusion of any liquid agent applied will be governed by their number and arrangement.

The two important limiting factors that apply to the everyday problems of the cotton processor are the size of the molecule of the substance he wishes to apply, and the size and distribution of the pores or open spaces in the fiber to be treated.

Water is the most frequently used solvent for fiber-processing chemicals, so the size of the water molecule usually determines the initial penetration of water-borne chemicals or dyes into any fiber.

It is generally agreed that water cannot penetrate the crystalline cellulose lattice; but it can enter the amorphous, or open, areas readily and break the relatively weak links between these less-ordered chain molecules. The water pushes these molecules and the crystallites farther apart, making it easier for larger molecules to penetrate the fiber. The water swells the fiber until the swelling force is balanced by the elastic forces set up by the deformation of the fiber.

Du Pont Dyes for Creslan Acrylic Fiber

Anon, *Dyes & Chem Tech Bull (du Pont)* **15**, 20-30, Mar, 1959

The Creslan acrylic fiber, made by Am Cyanamid Co, which is now coming into commercial production, is dyeable by several classes of dyes, as follows:

Acid dyes and metallized dyes, both acid and neutral, are recommended for the bulk of Creslan dyeing, for stock, top, tow, yarn and piece goods.

Cationic (basic) dyes are used for extremely bright shades requiring nominal lightfastness.

Chrome dyes are recommended for

heavy-duty end-uses.

Disperse dyes are suitable for pastel shades (eg, for sweaters). They do not require the use of a carrier.

Selected dyes of these various classes, particularly suitable for Creslan dyeing, are listed. Generally speaking, the fastness properties of acid, chrome and metallized dyes on Creslan are said to be equal or superior to those on other fibers. Full dyeing instructions are given. Conventional dyeing equipment can be used.

Fabrics containing blends with other fibers should not be kier-boiled, as alkali at high temperatures has a solubilizing effect on Creslan.

The physical properties of Creslan include resistance to moths, dry-cleaning solvents and strong organic acids. It has good flame resistance, and prolonged exposure to sunlight has negligible effect.

The "sticking" temperature of Creslan is 433°F. Drying temperatures should not exceed 230°F for long intervals.

The new fiber is expected to be used in a wide range of woven and knit fabrics for clothing and home-furnishing uses.

P-T-F-E: Toughest of All Fibers in Resistance to Chemicals and Heat

Anon, *Man-made Textiles* **35**, 56-7, May, 1959

A new fiber, made from polytetrafluoroethylene and marketed by Du Pont under the name Teflon, is described. The outstanding features of this fiber are its chemical inertness and its resistance to heat degradation. Details of the chemistry and manufacture of this product were given in an earlier issue (*ibid* 35, 59, Jan, 1959).

The stability of Teflon is said to be due to the saturation of the carbon-to-carbon bonds by fluorine atoms.

The general properties of the new fiber, which are listed in a table, include the following:

Ultimate tensile strength: 47,000 lbs/sq in at 70°F.

Flammability: Nonflammable; melts with decomposition.

Chemical stability: affected only by fluorine and chlorine, trifluoride gases at high pressures and temperatures, and alkali metals; completely inert to boiling sulfuric and fuming nitric acid and aqua regia, and to boiling saturated caustic soda.

Moisture absorption: nil.

Heat resistance: no degradation up to 450°F.

Handle: soft, slippery.

Color: brown; can be bleached to white by oxidation with hot mineral acids.

The fiber remains flexible and non-brittle over the range of —110°F to +525°F.

Fabrics made from Teflon yarn are being widely used for gaskets and pump packings, while its low coefficient makes it particularly suitable for unlubricated bearings, seals and other specialized applications.

The Constitution and Properties of Disperse Dyes

Straley, J M and Carmichael, D G, *Can Textile J* **76**, 49-53, May 1, 1959

The dyeing mechanisms of cellulose acetate and the polyester fibers are generally considered to be closely allied; in effect, a solution of the dye in the fiber is produced. Dyes that are too water-soluble do not dye readily; some of the disperse dyes sublime during ironing or hot-processing, and some lack fastness to gas fumes (containing oxides of nitrogen).

The authors describe the constitutions of a number of disperse dyes, both azo and anthraquinone, and show the relation of structure to color.

Fading of many disperse dyes on exposure to gas fumes is said to be due to the fact that the cellulose esters are excellent solvents for nitrogen oxides. It can be prevented by the addition of certain compounds (eg, melamine) which react by preference with the nitrogen oxides and thereby protect the dyes from fading until they are exhausted. Recently it has been found possible to give some of the anthraquinone dyes fastness to gas fading by the use of certain substituents in various positions on the anthraquinone ring, which are described.

Some of the disperse dyes having the best fastness to washing, light and gas belong to neither the azo nor the anthraquinone series (eg, dyes of the nitrodiphenylamine and nitroacridone classes). Dyes containing the methine or styryl group are said to have outstanding lightfastness.

Washfastness of superior quality, equal to that of vat dyes on cotton, has recently been obtained by choosing dyes of such structure that metal chelate rings can be formed. In dyeing from a bath, the metallic agent is applied afterwards by padding; in printing, however, the dye and metal salt are incorporated in the orthodox print paste.

The disperse dyes are also of some value in dyeing other fibers, such as modified acrylonitrile fibers and nylon. The fastness properties on nylon are generally somewhat inferior to those on acetate, but the fastness to gas fading is much better. Disperse dyes are used almost exclusively for dyeing women's nylon hosiery.

The disperse dyes so far have provided the only practical solution to dyeing the polyester fibers. To obtain deep shades, the addition of "carriers" or the use of extra high temperatures (pressure dyeing) is necessary. In many cases the fastness properties on polyester fibers are quite different from those on acetate. New dyes especially for the polyester fibers are now being developed.

The Detergent Problem from the Point of View of the Textile Manufacturer

Ward, C F, *Dyer* **121**, 333-6, Feb 27, 1959

The speaker referred to the advances in scientific achievement which have taken place since World War II, particularly in the realm of textiles, resulting in entirely new fibers and fabrics, new finishes, and a wide variety of fast colors. There has been an equally radical change, he said, in the domestic laundering of textiles, thanks to the development of the home washing machine.

The various detergents, used to a greater or less extent by the vast majority of housewives, are manufactured with two main objects in view: the first, to facilitate and make more efficient the removal of "soil", and the second, to produce in white articles a most attractive finish by the use of "optical whites" or "fluorescent whites", or, to quote the speaker, "to make the whites whiter".

He stated that the optical bleaching agents are now in general use as components of most detergents, to produce the brilliant white finish expected by the public. They have their drawbacks, however, if the washing machine contains colored garments as well as white, the optical bleach material may migrate from the white to the colored fabrics, and if pastel shades are present, they may be considerably altered (eg, a light blue shade may become a reddish gray).

The speaker also referred to the gradual deterioration in shade of many of the man-made fibers when washed with modern detergents. A white nylon slip, he said, became a dirty gray after a few washes.

He criticized the "common practice" of adding a spoonful of a chlorine compound to the laundry machine when washing white goods. This can lead to a serious weakening of the cloth, especially cotton and rayon. He understands that certain organic chlorine-containing compounds are now being incorporated in domestic washing powders in the U S. He anticipates that such a development will be expected to result in increased

complaints of loss of color, bad wear, etc.

The suggestion is made that synthetic detergents should be labeled, indicating whether or not they contain bleaching or fluorescing agents of any sort.

Permanence in Book Papers

Barrow, W J, and Sproull, R C, *Science* 129, 1075, April 24, 1959

Deterioration of paper in the book stock—especially among books of recent decades—has become a serious problem for libraries, but exact measures of the extent or rate of this deterioration have not been available. By the same token, no good indications have been available of the expected useful life of paper in books currently coming off the press. Furthermore, although attention has been given to means of counteracting one of the recognized causes of deterioration—pollutants absorbed from the atmosphere—similar attention has not been given to the problems of identifying and counteracting the other recognized source of deterioration—agents left in or introduced into the paper at the time of manufacture. An investigation was undertaken in an attempt to fill some of these gaps in our knowledge.

It has been found that modern books—even those written with a serious or scholarly purpose ("nonfiction") and published ("to last!") in hard bindings—are deteriorating rapidly, and many of those issued 25 to 50 years ago are now almost unusable. The paper of an average American publication of the first decade of this century retains only 4 percent of the folding endurance of a typical new book paper of today; even the paper in the average publication of the 1940's has already declined in folding endurance to 36 percent of today's new book paper.

Meanwhile this typical new book paper itself shows low initial strength (for example, folding endurance on the order of only 20 percent of that of book papers already 200 to 500 years old) as well as indications that it is subject to rapid deterioration.

Acidity appears to be the principal cause of deterioration, both in the older papers and the new. A stabilizing process for neutralizing this acidity was developed and was brought during the investigation to an initial stage of economic feasibility. This process appears to inactivate the most injurious properties found in new book papers and precipitates compounds into the fibers which should, in addition, counteract the effect of pollutants absorbed from the air.

A principal technique used for predicting the durability of paper is the accelerated aging procedure developed by the National Bureau of Standards; by extending the use of this technique, interesting decay curves have been obtained which facilitate comparison of modern papers with papers which have already demonstrated their stability for several centuries. These curves offer other values as well for the study of permanence in paper and suggest that a principle exists relating extended accelerated aging to even longer periods of natural aging than those with which it has hitherto been equated.

During the past 300 years the paper-maker has done an excellent job in meeting the demand for more and cheaper paper. A by-product of this accomplishment has been the production of many weak and unstable papers. This does not give rise to any problem where strength or stability are not critical, but where permanence is important, as in libraries of record, the problem becomes serious. While the present study describes a procedure for stabilizing initially unstable paper, much more remains to be done if relatively stable papers are to be made for books of lasting value. There is evidence that this is possible—that such papers can be made from certain types of chemical wood fibers at but little additional cost. But more research is needed, and the cooperation of the scientist, papermaker, printer, publisher, and librarian will be required to assure permanent books for the future.

BOOK REVIEW

Industrial Fatty Acids and Their Applications

Edited by E Scott Pattison
(Manager, Fatty Acid Producer's Council), Reinhold Publishing Corp, New York, NY
230 pp

The fatty acid industry is one of the most rapidly growing segments of the American chemical frontier. Some 400 million pounds of fatty acids are now being consumed annually by industry. The broad spectrum of usefulness of long aliphatic chains as chemical "building blocks" makes the future of the fatty acid industry ever more promising. Both the present and future of the industry and its processes are discussed by scientists from all of the major companies in this field of production and also several authors who are not directly associated with this industry. The book, which was conceived by the members of the Fatty Acid Producer's Council, is edited by E S Pattison, manager of the Council. Sixteen chapters on all the phases of the industry are handled in a brief, well-outlined form. Many graphs, pictures, tables, diagrams and lists of references to the scientific literature do much to enhance the book's usefulness as a ready reference for those interested in the field.—RJK

Chromatographic Reviews, Volume 1 (1958) (Progress in Chromatography Electrophoresis, and Related Methods)

Edited by Michael Lederer
Institut du Radium, Arcreil (Seine), France
Elsevier Publishing Co
Sole Distributors in the United States:
D Van Nostrand Co
New York, NY
Price: $8.75; 276 pp

Interest in chromatographic and electrophoretic methods has increased greatly in recent years. The newly founded *Journal of Chromatography*, which was planned to include critical reviews on separation methods written by experts, was found to be inadequate to meet the demands for reprints and information concerning the advantages and uses of these analytical tools. This resulted in the decision of the editors to publish the reviews in book form. This is the first of the series covering the year 1958 and it proves to be a fine beginning. The various chapters were either invited or selected so that the topics complete and enlarge upon the monographs "Chromatography, A Review of Principles and Applications," by E Lederer and M Lederer (Elsevier, Amsterdam, 2nd Edition 1957) and "Introduction to Paper Electrophoresis and Related Methods," by M Lederer (Elsevier, Amsterdam, 2nd Impressions, 1957). Altogether there are two chapters on general techniques, two on inorganic separations and five on organic compounds. The book has a very attractive format, with many graphs, tables and illustrations, one in color. The lists of references at the end of each chapter are particularly extensive. The book also has an excellent index.

The book includes a large amount of work on colored substances, their separations, purification and identification, and this fact should make the book of particular interest and utility for dye chemists. It is hoped by the editors that the reviews, which unlike the *Journal of Chromatography* are completely in English, will keep the reader informed of latest developments in chromatography.—RJK.

Patent Digest———

(*continued from page 36*)

groups, marketed by Atlas Powder Co under the trade name G 3780.

The sulfonation pretreatment of the fabrics, which is essential to the process, is carried out by immersion in oleum (preferred), conc sulfuric acid, sulfur trioxide or the like. It reportedly allows durable fixation of the functionally basic, N-containing antistatic agent. No damage to the polymeric material or to possible pigmented colorations thereof will occur, it is claimed, if the process is carried out under strictly controlled conditions.

Example: A colored fabric woven from pigmented polyethylene monofilaments was immersed at 50° C in 3% oleum (containing 3% free SO_3 dissolved in H_2SO_4) for about five minutes. Then the fabric was thoroughly washed and treated at 65° C for about five minutes in a one percent solution of the above-mentioned product G 3780. The antistatic effect obtained was retained after the fabric was washed in water for one-half hour at 55° C and in acetone after rinsing for five minutes.

US Pats 2,832,697 and 2,832,698 (same inventor) refer to similar antistatic treatments based on surface sulfonation. US Pat 2,832,697 protects an analogous process carried out on polyethylene products to which a non-aromatic chain is attached, eg, vinylidene chloride acrylonitrile copolymer. According to 2,832,698, the antistatic agent applied after sulfonation is a hydrophilic compound free of hydrophobic groups, eg, glucosamine.

Among the references cited by the Patent Office:

USPat 2,400,720 (Distillers Co Ltd /1946): sheets of hydrophobic resins, eg, polystyrene or phenolic resins, acquire a hydrophilic surface and antistatic properties by a treatment with sulfuric acid, SO_3 or the like.

USPat 2,626,876 (Am Cyanamid/ 1953): antistatic treatment of a vinyl resin with a fatty acid amido-substituted quaternary ammonium salt.

USPat 2,727,831 (Westinghouse Electric /1955): polystyrene articles are rendered antistatic by a sulfonating treatment; the sulfonate produced on the surface is transformed into its alkali salt.

DYEING OF POLYESTER FIBERS——— Dimethylterephthalate plus benzanilide as carriers C,4,07

USPat 2,833,613 (Du Pont——Hallada, Landerl ——May 6, 1958)

This patent refers to carrier dyeing of polyester fibers, ie, polyethylene terephthalate and cellulose triacetate, with disperse dyes. The preamble points up various undesirable characteristics observed when polyester fibers are dyed with customary carriers (benzoic acid, salicylic acid, phenylphenols), eg, high costs, toxicity, unpleasant odor, etc.

Disperse dyes, which do not otherwise sufficiently penetrate polyester fibrous materials, reportedly can be dyed in level heavy shades when mixtures of dimethylterephthalate with benzanilide in ratios from 1:3 to 3:1 are applied as carriers. At least two pbw of the mixed carriers must be present in the dissolved state in 1000 pbw of the dyebath. Dimethylterephthalate is substantially insoluble in cold water, but it can be solubilized by the addition of both components, preferably mixed with dispersing agents in a particularly fine subdivision (corresponding to at least 100 mesh), to the dyebath. Under these conditions, the mixture may be obtained as a free-flowing powder, producing saturated solutions of 2% concentration (col 2, lines 30-32).

Example: A mixture of 6500 pbw dimethylterephthalate, 6500 pbw benzanilide and 65 pbw of sulfated alcohols of chain length C 12-18 was micropulverised to pass a 200-mesh screen. The resulting white powder was tumbled in a roller mill for two hours. A dyebath prepared from CI Disperse Red 13 (CI 11115) and a carrier mixture of the above type reportedly dyed spun polyethylene terephthalate or cellulose triacetate a bright, level and lightfast shade. Inferior results were noted when the carrier mixture had a 10-mesh-screen particle size.

Among the references cited by the Patent Office:

Brit Pat 609,943 (Imp Chem Ind /1948): dyeing polyterephthalate ester fibers with disperse dyes, optionally in the presence of swelling agents, among them phenols, amines, amides, and so on. Neither dimethylterephthalate nor benzanilide are mentioned in the list of appropriate swelling agents (p4, lines 109-127 of the specification).

IMPROVING FASTNESS OF WATER-SOLUBLE DYES——— Dicyandiamide condensates applied C,4,01

USPat 2,828,288 (Farbenfabr Bayer——Taube et al——March 25, 1958)

Application of dicyandiamide-formaldehyde condensates to improve the fastness of dyeings obtained with water-soluble (direct) dyes is generally known.

Particularly good effects are obtained, according to the current patent, by condensing one mol dicyandiamide with 0.75 - 1.5 mols formaldehyde in the presence of 0.33 - 0.75 mols hydrochloric acid at 30 - 100°C. The neutralized solution is filtered and concentrated under reduced pressure to a water-soluble powder, which must be further heated to 120-160°C (preferably 150°C) for several hours more, following which the product is still water-soluble. It may be applied in aqueous solution, optionally in combination with copper salts, to improve the water-, perspiration- and washfastness of direct dyeings or prints.

Among the references cited by the Patent Office:

Ger Pats 323,665 and 325,647 (Wallasch/1919): formaldehyde and dicyandiamide are condensed in the presence or absence of sulfuric acid to prepare adhesives.

Yampolskaya/1940 [*Chem Abst 37*, 1273^7 (1943)]: improvements of direct dyeings obtained by an aftertreatment with Cu or Cr compounds, formaldehyde, or condensates thereof with dicyandiamide have been studied and evaluated.

REDUCING THE FORMALDEHYDE LIBERATION IN RESIN-FINISHED FABRICS——— Aftertreatment with acceptor G,2,04

USPat 2,833,670 (Am Cyanamid Co——Roth—— May 6, 1958)

Fabrics treated with formaldehyde resins tend to liberate the formaldehyde in storage. This drawback is felt especially when highly concentrated condensate solutions are used. In certain instances, concentrations of 30% up to 80% resin content (particularly of the partially alkylated or partially polymerized urea-thiourea-formaldehyde type) are frequently employed; for instance, in flame-resistant finishes.

The upper tolerable limit of free formaldehyde developed after 20 hours in storage at 100° F and 100% relative humidity is said to be 0.3% owf. A simple test for determining this quantity is presented in col 2, lines 34-56 of this specification.

The current invention calls for reducing the liberation of formaldehyde by an aftertreatment with an acceptor, eg, urea, dicyandiamide, etc, capable of reacting with formaldehyde to prevent volatilization. Other suitable acceptors are indicated in col 3, lines 18-30. They may be applied at room temperature by spraying or padding, and dried afterwards at room or elevated temperatures (up to 50° C).

Example: An 80% concentrated

solution of a bisulfite-modified, partially methylated urea-thiourea-formaldehyde resin product plus ammonium chloride was padded on a nylon fabric to a wet pick-up of 100%. The fabric was then heated for 60 seconds to 310°F, cooled to room temperature, sprayed with a 5% solution of urea, and finally dried again at room temperature. According to a table, a blank pretreated as above but not sprayed with urea solution liberated 1.8% formaldehyde, while a 5% urea-solution-sprayed specimen developed only 0.3% formaldehyde. No formaldehyde was liberated when the spraying solution contained 10% urea.

References cited by the Patent Office:

USPat 2,267,276 (Rohm & Haas / 1941) refers to odor prevention in fabrics finished with urea-formaldehyde condensates by a treatment with oxidizing agents under alkaline conditions, eg, with alkaline peroxide or sodium perborate.

Brit Pat 312,433 (Dunlop Rubber Co/1929): articles covered with a layer of rubber latex frequently have objectionable odors, which can be destroyed by immersion of the articles in a formaldehyde solution. The strongly adhering formaldehyde is subsequently removed by a treatment with ammonia.

WATER-REPELLENT FINISH——O-I-W emulsions containing high alkyl etherified methylolmelamines G,2,02

USPat 2,835,641 (Ciba Ltd——Widmer et al ——May 20, 1958)

Emulsions for hydrophobic purposes, protected by the current patent, contain in the oily phase:

a) a methylolated melamine etherified with a higher alcohol; and

b) another water-repellent compound of the natural or synthetic wax group, such as paraffin wax (col 1, line 65 to col 2, line 14).

The ratio of a:b is within the limits of 5:1 to 1:19.

According to a procedure outlined in *Helv Chim Acta 24*, page 318 E (1941), water-insoluble products, such as "a", are prepared by melting the methylether of hexamethylolmelamine with a higher alcohol, eg, octadecanol, and reetherifying by adding some conc hydrochloric acid at 90°C under reduced pressure to remove the liberated methanol.

The aqueous phase contains a water-soluble high-molecular substance (preferably polyvinylalcohol), methyl cellulose, or carboxymethylcellulose (CMC) combined with an emulsifying agent, such as heptadecyl benzimidazole disulfonate (Ultravon W), or a condensate of a higher alcohol with ethylene oxide. Ratios of aqueous to oily phase may vary from 55 : 45 to 80 : 20. An acid or potentially acid catalyst must be added to the emulsion upon dilution before use. Examples are HCl, aluminum chloride, ammonium chloride, and so on.

Example: The aqueous phase consisted of 10% polyvinylalcohol and the abovementioned anionic surfactant dissolved in water under alkaline conditions. A melt of paraffin wax (b) and the octadecylether of methylolmelamine (a) was stirred at 90° C into the aqueous phase until the emulsion was formed, which was homogenized upon the addition of ammonia. Cotton gabardine was treated in a bath consisting of one part of the above emulsion, 0.1 part ammonium chloride, 0.05 part formic acid and 9 parts water, then squeezed to a wet pick-up of 100%, dried at 90° C, and baked for 15 minutes at 125-140° C. The fabrics so treated reportedly had very good hydrophobic properties; the effect was fast to boiling for 30 minutes in five g soap and two g soda ash per liter.

References cited by the Patent Office:

USPat 2,344,926 (Rohm & Haas/ 1944) describes a hydrophobic w-i-o emulsion containing a solvent-soluble urea-formaldehyde condensate, a higher aliphatic alcohol, solvents, an organic solvent-soluble alkylcellulose, metal soaps, and paraffin waxes in the oily phase.

USPat 2,426,770 (Am Cyanamid/-1947): imparting hydrophobic effects to textiles by impregnating with emulsions of lower alkylated methyol melamines plus higher alcohols. The effect is partly an ether interchange and partly further polymerization (col 2, line 54 to col 3, line 30). [Cf *Am Dyestuff Reptr 37*, 244 (1948)].

USPat 2,586,098 (Ciba/1952): aqueous emulsions of solvent-soluble urea-formaldehyde condensates are prepared by emulsifying the solvent solutions in an aqueous solution containing a protein plus a hydrotropic carbamide, ie, urea or thiourea.

DYEING WOOL WITH NEUTRAL-DYEING METALIZED AZO DYES———Treatment with polyoxyethylene glycol C,4,04

USPat 2,835,550 (Du Pont——Laucius, Pearson ——May 20, 1958)

Recently, neutral-dyeing metalized azo dyes have been developed, which are characterized as reaction products of one Cr or Co atom on two mols of an ortho-hydroxy monoazo dye, and which are free of salt-forming substituents. Application of these dyes, which require less concentrated acid baths, would be most desirable; however, according to the preamble to this patent, they do not produce level, well-penetrated dyeings.

The problem of level dyeing with the metal complex azo dyes reportedly has been solved by treating the material before or during the dyeing procedure with an auxiliary product defined as polyoxyethylene glycol. A preferred compound is prepared from a polyoxypropylene glycol of mol weight 900-2000 reacted with ethylene oxide until the mol weight has increased to 7000-9000. This condensate contains approximately 10-22% of the original polyoxypropylene glycol and 78-90% polyethylene oxide (see USPat 2,674,619 of Wyandotte Chem Corp/1954). Dyeing must be carried out in the presence of acid-generating agents, especially ammonium salts of sulfuric, phosphoric, hydrochloric, tartaric, or acetic acids or mixtures thereof.

The polyoxyalkylene glycol must be applied in amounts not exceeding 2% owf. The levelling effect observed within the limits of 0.5-2.0% is very surprising because higher percentages will product resist effects and amounts of 10% will strip about 80% of the dye from the fiber.

Example: Wool gabardine was treated for 10 minutes at the boil in an aqueous solution of 4% owf ammonium sulfate and 1% owf of the abovementioned polyoxyalkylene auxiliary, following which one of the neutral-dyeing metal (Co or Cr) complex azo dyes listed in a table in col 3, lines 34-48, was added. Dyeing was continued at 212°F for one and one-quarter hours.

It was observed that 0.5% of the auxiliary agent generally improved the levelness of the dyeings, albeit to a lesser amount than 1% of the agent. Addition of 2% gave the same level results as 1%, but the dyeings appeared to be somewhat weaker.

Among the references cited by the Patent Office:

USPat 2,674,515 (Ciba/1954): dyeing wool with dyestuffs in which one Co or Cr atom is linked to two complex-forming dihydroxy monoazo dyestuffs solubilized by a sulfonic acid amide group.

Brit Pat 701,192 (Bad Anilin-& Sodafabr/1953): penetration of polyamide fibers (nylon) by complex metal azo or azomethine dyes is improved generally by the addition of a water-soluble polyhydroxy alkyl ether, eg, an ethylene oxide condensate of higher fatty acids, of a higher alcohol (dodecanol), a polycondensate of ethylene oxide forming a

polyglycol ether, etc. [Cf *Am Dyestuff Reptr 44*, 369 (1955)].

SHRINKPROOF AND ANTISTATIC TREATMENT ——— Melamine condensates plus magnesium chloride as curing agent G,1

USPat 2,839,506 (Am Cyanamid——Cooke et al ——June 17, 1958)

A great variety of curing agents for amino triazine resins have been suggested in the past, especially acids and acid salts, including acid salts of organic amines. The object of the current invention is to provide an improved curing process based on the use of magnesium chloride for the above purpose.

It has been observed that this treatment is particularly effective with N-containing fibers, such as linear polyamides, wool, homo- and copolymers of acrylonitrile. It is also suitable for cellulosic fabrics, polyester fibers and so on (col 2, lines 20-33). Many desirable effects afforded in the treatment of textiles with the above compositions are reported, such as stability of the baths (slightly on the alkaline side), neutral condition of the cloth after curing (thus not requiring an afterwash to avoid acid damage), and less chlorine retention by textiles exposed to a chlorine bath after curing. Although the latter surprising effect is not quite understood, a theory has been advanced that it is based on a possible chelation reaction between magnesium chloride and the aminotriazine condensate. Also prevention of static accumulation on hydrophobic synthetic fibers (nylon, Dacron, Orlon, etc) treated with the patented composition has been observed and particularly protected by the claims. Relatively large amounts of $MgCl_2$ have to be incorporated into the aminotriazine condensate in this event. As a rule, the resin composition used for customary textile treatments may contain 2-20% magnesium chloride on the dry resin's weight while 22-90% or even more must be employed for antistatic treatments. Salts of other metals, including other magnesium salts, eg, sulfates, reportedly do not produce equal results in curing (col 3, lines 44-50).

Example: A treating bath was prepared from 5.5 pbw of an 80% solution of methylated trimethylol melamine and 1.1 pbw $MgCl_2.6H_2O$ in 93 p water at 120°F. This solution was padded on a bleached cotton fabric with a wet pick-up of 80%, dried at 225°F, and cured at 350°F for a minute and a half. The wrinkle recovery of the treated specimen was superior to that of a sample treated with an analogous composition in which magnesium chloride had been replaced by isopropanol amine hydrochloride.

Among the references cited by the Patent Office:

Fr Pat 822,349 (I G Farben A G /1937): composition of urea-formaldehyde and various alkaline earth salts, among them $MgCl_2$, are useful as adhesives upon drying.

USPat 2,504,857 (Bancroft & Sons /1950) : imparting crease resistance to cotton fabrics by applying mixtures of methylated and nonmethylated methylol melamines. [Cf *Am Dyestuff Reptr 39*, 524 (1950)].

USPat 2,653,921 (Ciba Ltd/1953) : catalysts for hardenable aminoplasts include products prepared in aqueous solutions from boric acid and calcium chloride or other salts, such as the chlorides of Ba, Zn, Mg and so on.

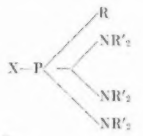
ANTISTATIC TREATMENT with quaternary phosphonium salts G,1

USPat 2,837,446 (Monsanto Chem Co——Cohen, Scott——June 3, 1958)

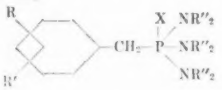
Textile materials, and particularly nonspun fibers or fiber mixtures containing at least 10% by weight of staple fibers of a fiber-forming synthetic polymer, eg, vinyl, vinylidene, polyester, acrylonitrile and polyhexamethylene adipamide fibers, reportedly are rendered antistatic by a treatment with an aqueous solution of a quaternary ammonium salt.

The synthetic-fiber material may be blended with wool or natural or regenerated cellulosic fibers or derivatives thereof, such as rayon, cellulose acetate, and so on. (Cf col 2, lines 19-33).

Phosphonium salts to be applied in this method have the general formula



or preferably



wherein R and R′ are Cl, Br, H, or lower alkyl; and R″ is lower alkyl. Anion X may be Cl, Br, or an aliphatic monocarboxylated radical containing 8-24 C atoms.

After the above phosphonium salts are applied in solid concentrations of 0.01-5.0% by immersion or spraying, the goods are dried at room temperature up to 110-200°F.

Example: A mixture of nonspun fibers consisting of 50% wool and 50% of a heteropolymer of 85% acrylonitrile and 15% styrene was sprayed with a 2% aqueous solution of benzyl tris (dimethylamino) phosphonium bromide until the fibers contained 100% of this solution. The mixture was then dried at 80°F. The fibers so treated did not accumulate static charges during processing and spinning. Other examples refer to similar treatments of synthetic filaments and woven fabrics containing synthetic fibers.

Among the references cited by the Patent Office:

USPat 2,543,539 (Am Cyanamid/ 1951): vinylacrylonitrile copolymers are rendered antistatic by a treatment with phenylguanidinium stearate.

USPat 2,742,379 (Du Pont/1956) covers an antistatic agent consisting of a mixture of alkanolamine salts of phosphoric acid alkylesters. It is characterized by the presence of -P-O-P- linkages.

FIREPROOFING OF TEXTILES ——— Chlorine-modified vinyl resins plus antimony phosphate G,2,03

USPat 2,852,414 (British Jute Trade Research Assoc——Broatch——Sept 16, 1958)

The flameproof finish for textiles (particularly jute fabrics) protected by this patent is a combination of antimony phosphate and a chlorine-containing vinyl thermoplastic resin suspended in an aqueous solution of carboxymethylcellulose.

Preferably, the resin is internally modified by copolymerization to avoid a final high-temperature treatment (col 1, lines 37-40). An example of such a product is British Geon Ltd's Latex 652.

A very high degree of fire resistance, which is said to persist after a long outdoor weathering or after one month's immersion in sea water, is claimed. The combination of chlorine and antimony provides for flame resistance while the content of phosphate ions inhibits afterglow.

Example: A woven jute fabric was padded in a bath containing 76% of a chlorine-containing vinyl resin in the disperse state (55% solids), 12% antimony phosphate, 4% CMC (2% aqueous solution), and 8% water. It was squeezed to a 150% wet pick-up.

Among the references cited by the Patent Office:

USPat 1,885,870 (Snyder/1932): imparting water-resistant and flameproof properties to textiles, such as cotton, jute, etc, with a chlorine-containing vinyl copolymer.

USPat 2,519,348 (Am Cyanamid/ 1950) describes a flameproofing composition consisting of a dispersion of metal oxides, among them antimony oxide, water-soluble phosphates, and a thermoplastic vinyl chloride copolymer. [Cf *Am Dyestuff Reptr 40*, 105 (1951)].

News of the Trade

New Labeling Requirements of TFPIA Discussed Widely

Interest in the rules and regulations under the Textile Fiber Products Identification Act, which becomes effective March 3, 1960, has prompted several organizations to sponsor meetings to clarify questions about it.

As a membership service, The Textile Distributors Institute, Inc sponsored an open meeting on June 23 to which all branches of the textile industry, as well as the executive heads of the textile and allied trade associations were invited to attend.

Following this, on July 1 the Textile Section of the New York Board of Trade sponsored a symposium on the requirements of the Act.

At the TDI meeting, held in the auditorium of the Engineering Societies Building in New York, the following panel of industry leaders summarized the provisions of the new rules: Jesse D Wolff, Weil, Gotshal & Manges, TDI counsel, *moderator;* Harold Kennedy, Deering, Milliken & Co, Inc; Ely Kushel, Weil, Gotshal & Manges; Lester D Melzer, United Merchants & Mfrs Inc; Bernard Rapoport, M Lowenstein & Sons, Inc; Richard Roaman, Reliable Textile Co, Inc; Walter E Scholer, American Viscose Corp; and Jackson E Spears, Burlington Industries, Inc.

TDI has provided its members with a summary of the final rules prepared by its counsel, Weil, Gotshal & Manges.

Regarding finishers' or processors' liability under the Act, the summary states:

"The person who requests the dyer, processor or finisher to state fiber information on labels, invoices, etc, is responsible for any misstatement or omission made in such labeling, invoicing, etc, by the dyer or processor. However, the rule further provides that this provision does not relieve the processor or finisher of his duty or liability under the Act. We assume this to mean that if a distributor instructs his dyer or finisher to correctly label merchandise and the dyer or finisher makes a mistake and mislabels it, both the distributor and the dyer or finisher are still responsible for the error."

Regarding the labeling of imports, the summary states:

"Imported textile fiber products must be labeled with the name of the country where the imported product was processed or manufactured. For example, a fabric imported into the United States in the greige but finished and dyed in the United States, must show the country where the greige fabric was manufactured. However, where a new textile product actually is made in the United States from an imported textile fiber product, the country of origin of the fabric need not be shown; for example, a shirt manufactured in America but made of imported fabric need not show the country of origin of the fabric."

TDI has recommended that its members start complying with the requirements of the Act as soon as possible so as to make the transition easier and the avoidance of unintentional violations more certain.

At the meeting of NYBT's Textile Section, held at the Hotel Astor, New York, NY, Harvey Hannah, chief, wool and fur labeling division, Federal Trade Commission, discussed the rules in general, following which a panel consisting of men from various segments of the textile and apparel fields discussed implications of the law in their respective fields and answered questions from the floor. Seated at the dais, in addition to Mr Hannah, were Ralph J Bachenheimer, Ashby E Bladen, Robert P Lynn, Sidney S Korzenik, Ephraim Freedman, and Henry Stringer.

Those attending the latter meeting were furnished a copy of the Federal Trade Commission's "Rules and Regulations Under the Textile Fiber Products Identification Act." The text of the Act as well as the FTC policy regarding textile fiber products acquired prior to March 3, 1960 are included in the booklet, which may be obtained by writing to the Federal Trade Commission, Washington 25, DC.

Monsanto Silica Production Facilities Expanded

Monsanto Chemical Company has announced completion of expansion of silica production facilities at its Everett, Mass, plant.

Operated by the company's Inorganic Chemicals Division, the silica plant produces the division's Syton (colloidal dispersions of silica in water) and Santocels (silica aerogels).

The Syton products are used as textile chemicals for improving wool, worsted, cotton and rayon spinning efficiency.

Treplow Breaks Ground at New Plant Site

Treplow Products, Inc, Paterson, N J, held ground-breaking ceremonies on June 29 at its new, 30-acre plant site on Garrett Mountain, in West Paterson, NJ. Upon completion of construction in approximately four to six months, Treplow reportedly will have facilities to more than triple present plant capacity.

Treplow, a basic producer of alkyl aryl sulfonates, alkyl sulfates, alkanolamides, petroleum sulfonates, ethoxylated sulfates, organic acids and sulfated esters, is a pioneer in the sulfur trioxide sulfating/sulfonating process.

Planning for greater integration of its chemical intermediates, Treplow proposes to offer a wider range of end products.

Diamond Alkali Starts Up New Chlorine-Caustic Soda Facility

Diamond Alkali Company placed into operation its 20% chlorine-caustic soda plant expansion at Deer Park, Texas, on June 15. The start-up of the new plant is said to be timely in relation to gradually improved demand for chlorine and caustic soda this year. The initial operating rate of the new facility will be in excess of 50% of capacity.

The new facility reportedly brings the aggregate capacity of the company's entire Deer Park works to a nominal 750 tons per day of chlorine with a concurrent capacity of about 825 tons of caustic soda and 7,500,000 cubic feet of high-purity hydrogen.

FMC and Elfa, Ltd Announce H_2O_2 Expansion

Food Machinery and Chemical Corp and Elfa, Ltd, Electrochemical Works, Aarau, Switzerland, have announced the expansion of Elfa's hydrogen peroxide facilities. The new facilities incorporate the designs and techniques of the electrolytic process which FMC's Becco Chemical Division developed and uses at its plants in Buffalo, NY, and Vancouver, Wash.

Elfa is one of the world's first producers of hydrogen peroxide by the electrolytic method. The latest plant expansion reportedly was accomplished to meet growing demands in the textile bleaching industry and for other new chemical uses.

R&L Finds "Triple Strength" More Than Triples Service

More than a year of integrated operation reportedly has taught Riggs & Lombard of Lowell, Mass that each of its three component companies now supplies significantly more service to the trade than before they were combined as "three great names in one"—the original Riggs & Lombard, Inc, Parks & Woolson Machine Co, and Cook Machine Co, Inc.

The "triple strength" of the combined companies, according to Riggs & Lombard, has far more than trebled capacity for service, production and sales. As hitherto, Riggs & Lombard specializes in wet finishing machines and other equipment for woolen and worsted manufacturers. The Parks & Woolson division continues to manufacture wet and dry finishing machinery at its plant at Springfield, Vt. Cook Machine Co, a wholly owned subsidiary now situated at Lowell, continues to manufacture machines for the finishing of cotton and synthetic fabrics. Especially indicative of the new stature of the enlarged Riggs & Lombard combination, according to its management, is the trade demand for the company's composite engineering service "which now covers the entire field of finishing."

PTI, PTIF Annual Meeting

Bertrand W Hayward, president of the Philadelphia Textile Institute was re-elected head of the college and Everett L Kent, chairman of the board, Kent Mfg Co, was re-elected PTI Foundation president at the annual meetings of both corporations and their trustees last month.

Re-elected to the PTI board of trustees to serve three-year terms were C Scott Althouse, Althouse Chemical Co; Charles W Carvin, Charles W Carvin Co; Robert C Haines, Girard Trust Corn Exchange Bank; Theodore B Hayward; Robert L Huffines Jr, Robert L Huffines Jr Foundation, Inc; Everett L Kent; James G Law, Magee Carpet Co; William F MacDonald, E F Houghton & Co; Lindsey H Mason, Philadelphia Dye Works; F Everett Nutter; and Jacques Weber, Bloomsburg Mills.

Newly elected to the PTI board for three-year terms were: Herman Blum, Craftex Mills of Penna; Mildred Custin, Bonwit Teller; Henry C Froehling, E I duPont de Nemours & Co, Inc; and Lawrence Katz, Fidelity Machine Co.

Elected to serve two-year terms were: Hilding Krook, Robert Krook, Inc, and Edwin L Dale, Edwin L Dale Co.

At the trustees' meeting, the following officers were re-elected in addition to Dr Hayward for the coming year: W Lyle Holmes Jr, Archibald Holmes & Sons, chairman; C Scott Althouse, second vice president; Julius Zieget, PTI, secretary and treasurer; and Thomas Hyndman, solicitor. William F MacDonald was elected first vice president.

The Trustees passed a budget in excess of $450,000 for the operation of the Institute for the 1959-60 fiscal year.

Members of the Foundation's Trustees who were re-elected for three-year terms were: Ingram Bergman, Bergman Knitting Mills; DeHaven Butterworth, H W Butterworth & Sons Co; Michael Daroff, H Daroff & Sons; Lindsey H Mason; Russell C Osborne, R C Osborne & Co; and William Zimmermann, John Zimmermann & Sons.

New members elected for three-year terms include: Curt Baeringer, Eagle Dye Works; Blackwood Cameron; and Thomas L Stilwell, Warner & Swasey Co.

Other officers re-elected in addition to Dr Kent at the Foundation's meeting were: Theodore B Hayward, first vice president; Lindsey H Mason, second vice president; Richard S Cox, Dean Emeritus, PTI, executive secretary and treasurer; and Russell C Osborne, secretary.

Licensing of Chemical Specialties from Foreign Sources Suggested

Diversification has become a matter of great interest to many manufacturers. Licensing of technical chemical specialties from foreign sources to chemical manufacturers is suggested by Bennett-Rosendahl Co, Inc, as one means of helping the latter to add to their present products and branch out into new fields. These licenses reportedly include methods of manufacturing as well as use and sales data gotten from lengthy laboratory and commercial testing.

Bennett-Rosendahl Co, Inc, 10 Columbus Circle, New York, NY, business consultants to the chemical industry, are licensing agents for a number of old established foreign companies making chemical specialties for textiles, detergents, surfactants and other fields.

50th Anniversary, Special Libraries Association

The Special Libraries Association last month celebrated its 50th Anniversary, using the occasion to cultivate a better understanding of special library services.

SLA has made an effort to reach such audiences as present and potential employers, the personnel of organizations which have special libraries, students (for recruitment purposes), other library groups, civic organizations, and technical and professional societies. It is felt that a better understanding of the usefulness of special library services will strengthen the position of special librarians and encourage the creation of more special libraries.

One tool used in this campaign has been the SLA Publicity Kit, which is intended to furnish background and current information about special libraries and about SLA.

Copies of the Kit and other information may be obtained by writing to the Special Libraries Association, 31 East 10th St, New York 3, NY.

General Calendar

AMERICAN OIL CHEMISTS SOCIETY
Sept 28-30 (Statler Hotel, Los Angeles, Calif)

AMERICAN TEXTILE MACHINERY ASSOCIATION
May 23-27, 1960 (American Textile Machinery Exhibition, Auditorium, Atlantic City, NJ)

ASSOCIAZIONE COSTRUTTORI ITALIANI DI MACCHINARIO PER L'INDUSTRIA TESSILE
September 12-21 (3rd International Textile Machinery Exhibition, Milan Fair, Milan, Italy)

DRUG, CHEMICAL AND ALLIED TRADES SECTION, NY BOARD OF TRADE
Sept 17-20 (69th Annual Meeting, Sagamore Hotel, Bolton Landing, Lake George, NY)

NATIONAL COTTON COUNCIL
Oct 7 (Chemical Finishing Conference, Mayflower Hotel, Washington, DC)

SOUTHERN TEXTILE EXPOSITION
Oct 3-7, 1960 (Greenville, SC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Sept 15, Oct 13, Nov 4 (Luncheon meetings at the Hotel Roosevelt, New York, NY); Dec 2 (Annual meeting and dinner—Hotel Roosevelt, New York, NY)

TEXTILE RESEARCH INSTITUTE
March 24-25, 1960 (30th Annual Meeting, Hotel Commodore, New York, NY)

Particle Data Analysis Service

Interlab Inc has introduced a new particle data analysis service, which will be operated from its New York offices at 437 Fifth Ave in association with Particle Data Labs of Elmhurst, Ill. Firms located in Metropolitan New York, Westchester County, Northern New Jersey and Lower Connecticut are expected to be interested in this service, which uses the Coulter Electronic Principle to provide distribution curves (particle weight and size) on systems down to less than 0.5 micron. The scale of charges for analysis work is said to be quite modest, and accuracies of the order of 1% or better are claimed to be usual. Interlab also sells the Coulter Particle Counter throughout the same area and offers technical guidance on its application.

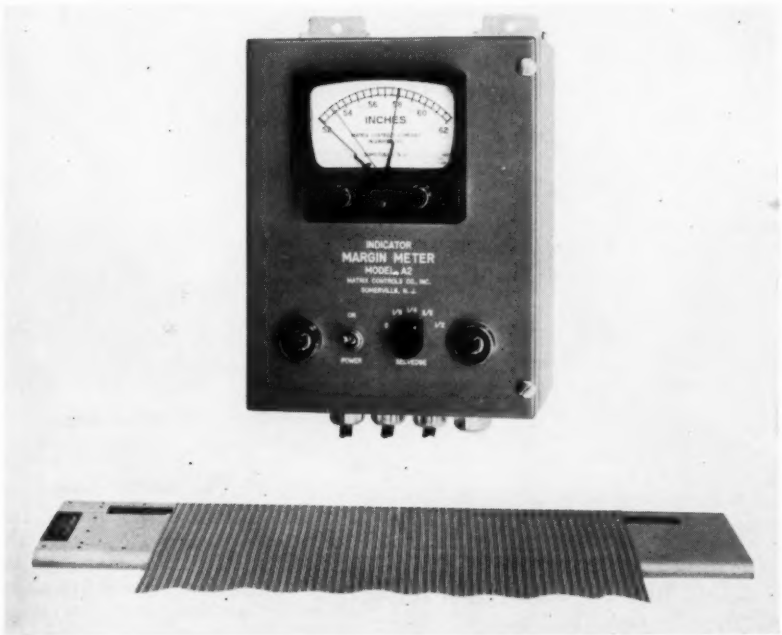
Elastic Plastic Covers

Greater cleanliness and efficiency in handling dye and chemical products in open vessels around the plant are said to be realized by the use of elastic-edged vinyl sheeting covers made by the Plastic Specialty Company. The new elastic plastic covers are said to be readily adaptable to provide effective seals on round, square or oblong vessels. They reportedly prevent evaporation loss of contents, moisture, or solvents, and effectively protect contents from dust, soil or other contamination from outside.

Elastic Plastic Covers, which are made of clear vinyl film four mils thick, are supplied in a range of standard sizes to fit openings from 2½ to 30 inches in diameter. Special sizes and materials can be supplied on special order.

The inert vinyl plastic film, held in place by its elastic edging, reportedly provides a dust- and vapor-proof cover for reaction vessels, drums, change cans, dryer trays and other containers for finished product or material in process. PSC states that, although the plastic cover gives a tight fit, it is readily removed when desired and can be used repeatedly.

For samples, prices and other information, address: Chemical Dept, Plastic Specialty Co, PO Box 978 MO, St Petersburg 1, Fla.



Margin Meter, showing indicator and measuring unit over which cloth is passing. Indicator pointer shows width is 53⅛ inches. Tolerance limits, dark pointers, are set at 52 and 58 inches. If the cloth width should go beyond either one, the red warning light on the bottom right will flash. On the left is a green light which indicates when the meter is properly set for operation. Allowance for the selvedge is made automatically by setting the pointer knob for the proper value.

Margin Meter

An electrical device that reportedly gives continuous and automatic cloth-width measurements without interrupting machines, and which actuates an alarm if preset tolerances are exceeded, is now available to the textile industry from Matrix Controls Company, Inc, PO Box 22, Somerville, NJ.

Said to be compact and simple to install, the Margin Meter is described as "a boon to mills, processors, and garment manufacturers, where yardstick measurement requires frequent machine stopping." It is claimed that one manufacturer estimates a 25% increase in sponging machine output, while anticipating that accurate measurement data will lead to a considerable reduction in cutting room waste.

The instrument consists of a measuring unit and an indicator, which gives a width reading as the cloth passes. Plugged into a 115 vac outlet, the Margin Meter is ready to operate after setting a selvedge allowance dial and two tolerance pointers. Optional with this measuring system is a recorder that prints a continuous width record.

In operation, the indicator can be placed at a distance convenient to the operator. A 20-foot cable is supplied with the meter.

Price is reported to be under $2,000. Dimensions of the indicator box are 10″ x 8″ x 4″.

Atco EUS

Metro-Atlantic Inc, Centredale 11, RI, has announced the addition of a new product, Atco EUS, to its line of ethylene urea products.

Atco EUS is described as ethylene urea supplied in a free-flowing, dry flake form that contains very low amounts of insolubles. Ethylene urea resin made from Atco EUS is said to be highly purified, requiring very little or no filtering to improve its clarity. Either formaldehyde or paraformaldehyde can be used with Atco EUS to manufacture the ethylene urea resin, it is stated. Due to its free-flowing flake form, Atco EUS is said to be very easy to handle and to load accurately into reaction tanks.

Dow Corning Z-6020

Commercial availability of an amino-silane chemical that reacts with both organic and inorganic materials to unite them in a strong, durable bond, has been announced by Dow Corning Corp, Midland, Mich.

Identified as Dow Corning Z-6020, the new silane has been employed to improve the performance of organic materials in a variety of commonplace applications involving glass fibers. Glass or mineral wool insulation, for example, is said to have greater resiliency, heat stability, and resistance to the damaging effects of moisture when Z-6020 is added to the binder resins.

In other applications, the addition of Z-6020 to the bonding resins reportedly produces phenolic, epoxy and melamine glass-cloth laminates with higher flexural and compressive strengths and improved dielectric properties. Glass fibers pretreated with a dilute solution of this amino-silane can be dyed with a variety of standard wool dyes, it is claimed. Z-6020 is also a coreactive diluent and curing agent for epoxy resins. The special nature of this new silane chemical is said to indicate an excellent potential for many other applications.

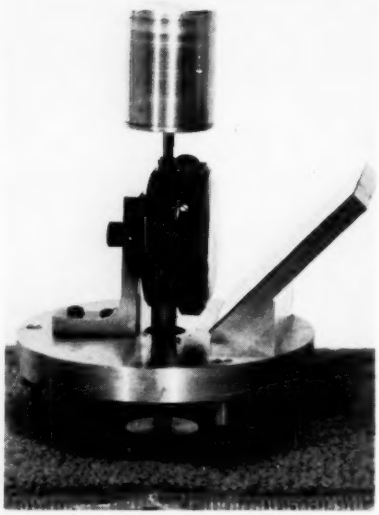
As part of a program to further industrial evaluation, Dow Corning will make experimental samples and detailed data available to recognized laboratories.

Levapal, Tanapon X-70

Levapal and Tanapon X-70, two new surfactants, have been introduced by The Tanatex Chemical Corp, Belleville Turnpike, Kearny, NJ.

Levapal is described as a complex modified anionic surfactant used to give level dyeings on goods containing polyester fibers. It is used in quantities of 2% owf to paste the disperse dye on the fiber, and is said to be particularly useful on fabrics that are difficult to dye evenly. A technical bulletin, which is available from Tanatex on request, compares surfactants generally used for this purpose.

Tanapon X-70 is a modified solvent-free surfactant used in the preparation of goods containing polyester and other fibers. Tanatex states that more waxes and fatty matter were removed by Tanapon X-70 than by any other surfactant and surfactant-solvent system evaluated. A technical bulletin shows a comparison of the cost of scouring per 100 lbs of goods and the amount of fatty matter and wax removed by the surfactant and surfactant-solvent systems used.



CSI Carpet Thickness Gage

Carpet Thickness Gage

Custom Scientific Instruments, Inc, Kearny, NJ, is now offering to the trade its Carpet Thickness Gage for measuring the wear of carpets under test where normal thickness gages are unable to measure.

The unit has a one-inch circular foot on a dial indicator with a weight which will exert on the specimen equal to 0.75 lb/in^2. Three needle points pierce the carpet until the point comes in contact with the base under the carpet. In this way, many different positions and at different periods of wear may be measured. A mirror mounted in front of the dial facilitates reading of the scale.

RCL Nuclear Thickness Gauge

The Ultra-sensitive Nuclear Thickness Gauge, Model 42000, a product of Radiation Counter Laboratories, Inc, Nucleonic Park, Skokie, Ill, is said to measure:

1) Textile thicknesses to two-millionths of an inch without contacting textiles.

2) Thickness of impregnations, protective coverings and coatings to within 0.01% of total material thickness; and

3) Changes in Basis Unit Weight of .005 mg/sq cm.

Use of the gauge in conjunction with RCL's automatic controls provides automatic uniform product consistency, it is claimed.

Textiles flow past a small radioactive source. The gauge measures amount of radiation passing through the textile. Changes in textile thickness cause changes in strength of radiation detected. This change is shown in units of thickness or in weight per unit area.

Gauge characteristics reportedly include the following:

1) A-C ampification through vibrating reed capacitor.

2) Input thermostatically controlled at constant temperature.

3) Pre-ampifier is remote from measuring point, and unaffected by environment.

4) Time response is continuously variable from ¼ to 30 seconds.

5) Full temperature compensation.

6) Single electronics unit permits detection at two separate points.

GFB Micron Particle Distributometer A.1

The GFB Micron Particle Distributometer A.1, which is manufactured and sold exclusively by G F Bush Associates, Box 175, Princeton, NJ, is a research, testing, and production control instrument for the continuous indication on a precision-recorder chart of the weight vs time of any sample particles in the range of one to 100 microns as they accumulate on a balance pan by settling in a liquid. From this curve, a weight or number distribution may be obtained, ie, the percent number or weight of particles of each diameter in the sample.

It is claimed that the excellent reproducibility of the Distributometer in duplicate analyses shows that the particular methods of separation of the sample into its individual particles, and maintaining this separation before and during the recording, are valid. It is reported that these methods are not complex, require no additional apparatus, and only one minute of preparation. Cleanup time between runs is said to be about one minute.

The unit is said to be extremely sensitive; eg, for a common material such as sulfur or aluminum, the sensitivity is about 30 microamps/-milligram, so that a sample of one gram gives an output current which is usually full scale for conventional recorders.

Accuracy of the unit is said to be about pom 2% based on reproducibility and absolute measurements. 115 vac single-phase 60 cycle, polarized plug-in fuse is ready to use. Physical dimensions: 22 x 22 x 8 inches deep overall.

Special models can be supplied, eg, for gas instead of liquid settling; for particles outside the one to 100 micron range; and for chart indication of weight vs time and/or particle number or weight of each diameter vs diameter.

Further information may be obtained by writing to G F Bush Associates.

SHEAR-FLOW

the modern mixer with power shearing

Finer, faster blending, dispersing and homogenizing is now possible with Shear-Flow's new Model RL Hi-Shear Head. Finely spaced dual impellers induce considerable shearing action and high pumping pressures that rapidly reduce particle size for superior material mixtures.

- Greatly reduces mixing time
- Uniform circulation—no vortex
- Emulsifies immiscible liquids
- Controllable flow pattern
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- Chemically inert seals
- Handles viscous materials with ease
- No operating Torque
- Disperses, blends, homogenizes

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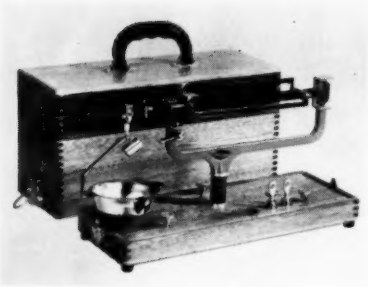


Ohaus Portable Balance

Ohaus Portable Balance

Ohaus Scale Corp, 1050 Commerce Ave, Union, NJ, has added a portable balance to its line of laboratory balances and weights. The balance, which is contained in a mahogany case, can be used when the top is removed. It is said to be sensitive to 10 milligrams, has a capacity of 311 grams, and is supplied with two 100-gram attachment weights.

Beams are graduated as follows:

Front beam - 0 to 1 gram in .01-gram divisions.
Back beam - 0 to 10 gram in 1-gram divisions.
Center beam - 0 to 100 gram in 10-gram divisions.

Price is $49.50.

Improved Labline Chromatofuge

The Labline Chromatofuge, designed by Hugh J McDonald, authority on chromatography, has been further improved. It is said to deliver more accurate differential separations of amino acids, steroids, hypoproteins, selected dyes, etc in only 15 to 20 minutes. Multiple separations reportedly may be run simultaneously.

The speed with which resolutions are now secured is said to lessen the need for temperature control. while eliminating many of the difficulties normally associated with this technique.

It is stated that a spring-closure seal retains the solvent-saturated atmosphere within the rotor during its operation, thereby preventing the paper sheet from drying prematurely, and assuring more accurate results.

Prewetted, full 18″ diameter, circular paper sheets for chromatographic separations of lipoproteins reportedly can be used on the Lablime Chromatofuge without tearing. Rf values are said to be readily determined.

The housing is Monel metal. Interchangeable, short-bore capillary feed

Model 5060 Labline Chromatofuge

tubes are chemically resistant and designed to give a smooth, continuous flow of solvent.

Labline chromatofuge, Model 5060 is complete with ⅓ HP variable-speed drive, built-in timer and tachometer. It has reported speeds to 900 rpm, and lists for $1,295.00.

A two-color bulletin on the instrument is available from Labline, Inc, 3070-82 W Grand Ave, Chicago 22, Ill.

MCC Supplying Lauryl Bromide in Commercial Quantities

Michigan Chemical Corp, St Louis, Mich, has announced the availability, in commercial quantity, of lauryl bromide, which may be used as an intermediate in the preparation of quaternary ammonium salts exhibiting germicidal and algicidal activity.

Michigan Chemical's new product is said to be of high purity, having a minimum bromine content of 30%, free alcohol content of less than 1%, and a specific gravity of 1.020 to 1.028.

"Textile Magic Marker"

Fabrics may be marked quickly, easily and indelibly, it is claimed, with the new Textile Magic Marker, a product of Speedry Products, Inc, PO Box 27, Richmond Hill, Jamaica 18, New York. Latest in the Company's Magic Marker line of marking devices, the new product is said to be universally applicable to any and all fabrics, textiles and coatings. While it is claimed to be particularly useful in the textile, laundry and drycleaning industries, it can also prove helpful to homemakers in marking and identifying articles in the home.

Model #83 Speedry Textile Marker

It is claimed that the Textile Magic Marker cannot clog, starve, leak or gum up. Its marking is said to be instant dry, and reportedly will stay on through innumerable launderings and drycleanings without bleeding, chemical reaction or obliteration. It is said to permit control of ink flow for small or bold writing.

Known as the Model #83 in the Speedry Line, the Magic Marker is available in four colors: white, yellow, red and black, the dark colors for light fabrics, the light colors for dark fabrics. It retails for 99c.

Ecco Defoamer KDX

"Giving good money value to users" is the report to Eastern Color & Chemical Co on practical field experience with the company's recently introduced Ecco Defoamer KDX.

Ecco Defoamer KDX is described as a white, stable, viscous emulsion. Used in dyebaths to control excessive foam, Eastern states, the new Ecco Defoamer is achieving superior performance.

Full information on properties and application of Ecco Defoamer KDX and related products is available from Eastern Color & Chemical Co, 35 Livingston St, Providence 4, RI.

Artisil/Foron Brilliant Yellow 6GFL Pat Ultradispersed

Artisil/Foron Brilliant Yellow 6GFL Pat Ultradispersed is a new Sandoz brilliant greenish yellow disperse dye which is said to have excellent fastness properties on man-made fibers. The dye is said to be especially suitable for use on polyester fibers. Its extremely fine particle size, 0.5 to 1.0 micron, also indicates usefulness for package dyeing and printing. Sublimation reportedly is rated excellent. Fibers on which it may be used include the acetate, triacetate, acrylic, polyamide and polyester types.

• NAMES IN THE NEWS •

Schwemmer

F M Schwemmer has been appointed as general chairman for the 1959 Annual Convention of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, to be held at the Sagamore Hotel on Lake George, NY, during the week-end of September 17th through 19th. Mr Schwemmer is vice president of White Laboratories.

David X Klein has been appointed technical director of the Heyden Chemical Div, Heyden Newport Chemical Corp. Mr Klein, formerly manager of research at the company's Garfield, NJ laboratories, will be responsible for the division's expansion and new products program, reporting to **R M Aude**, the division's general manager.

Melvin Mark, a full professor in the department of textile engineering at Lowell Technological Institute since Feb, 1957, has been appointed dean of faculty, replacing **Charles F Edlund**, who has retired because of illness.

David Mitchell Edwards, Cedartown, Ga, has been named winner of Nopco Chemical Co's Charles P Gulick Scholarship for 1959. Mr Edwards is the son of **Clifford W Edwards**, a machinist at Nopco's Cedartown plant.

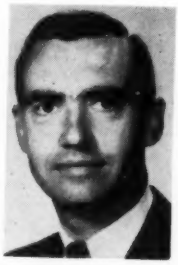
Mr Edwards has made application for admission to Emory Junior College at Oxford, Ga, where he will major in physics. Eventually he hopes to go into the research field.

Established in 1956, the Gulick Scholarship is a tribute to the memory of Nopco's founder, who died in 1955, and to his interest in the education of America's youth. Awarded annually to the son or daughter of a Nopco employee, the Scholarship provides the winner $750 per year for four years at any accredited college of the recipient's choice. The winner is selected on the basis of scholastic achievement, financial need, character, and all-round personality.

The North Carolina Division of Chemical Products Corp, West Paterson, NJ, has announced the appointment of **Alexander P Roy** as Southern representative.

Mr Roy, former principal of Consolidated Color & Chemical Co, has had extensive experience in dyeing, finishing and processing of textiles. Mr Roy will service Southern mills and plants, operating from his former office and warehouse at 521 Penman Street, Charlotte, NC. (Telephone: Franklin 6-2650.)

Broughton



Partrick

Miner

Appointment of **John G Broughton Jr**, to the newly created position of field sales manager of the Organic Chemicals Div, Dewey and Almy Chemical Div, W R Grace & Co, Cambridge, Mass, has been announced.

Broughton, who has been Eastern regional sales manager since 1955, will have direct charge of the national sales force from Cambridge headquarters.

Succeeding Broughton as Eastern manager will be **Arthur D Partrick**, who has been a sales representative. His headquarters will be at Clifton, NJ.

Amos J Miner, who has been with Dewey and Almy since 1957, succeeds **William A Morton** as Midwest regional sales manager at Chicago. Morton's March appointment as assistant research manager in the Organic Chemicals Division was previously announced.

Hagemeier

Colton Chemical Co, a division of Air Reduction Co, Inc, Cleveland, Ohio, has named **Richard Hagemeier** as sales representative in the Chicago branch office under **D M Stettler**, branch manager.

Hagemeier joined Colton Chemical Co from the Cleveland branch of McKesson & Robbins Inc, Chemical Division. In the Chicago office, he will represent Colton in the sales of resins for the textile and other industries.

William L Hyden, who had been closely identified with research on cellophane and textile fibers for most of his 32 years with the Du Pont Company, retired at the end of last month.

Dr Hyden will turn his talents to teaching this fall at Belmont College in Nashville, Tenn, where he has been appointed professor of chemistry. Prior to joining Du Pont, Dr Hyden was professor of chemistry and head of that department at Centre College.

Dr Hyden, who until recently was concerned with new products in the company's Textile Fibers Department, began his Du Pont career in 1927 as a research chemist at the Buffalo, NY, rayon plant. A short time thereafter he entered cellophane research, and during the next 20 years he advanced to become assistant director of cellophane research, a position which he held until 1947 when he was transferred to Wilmington as director of the auxiliary research sections.

In 1952 he was made director of the Textile Research Division. It was during this time that the textile research laboratory was constructed at the Chestnut Run location near Wilmington. Two years later, when the Textile and Industrial Products Research Division was formed, he was named associate director for a brief time before the department's new Merchandising Division was organized. In the latter division he was manager of the development section until he was assigned to new products in 1956.

McCann

Pillsbury

Huse

Metro-Atlantic, Inc, Centredale, RI has appointed **M M McCann** to the technical and sales staff and promoted **Charles Pillsbury Jr** and **George Huse,** formerly research group leaders, to the positions of cosupervisors of research and development.

Mr McCann, who has been engaged in sales and demonstration work since 1936 and is familiar with all phases of textile dyeing and finishing, will work out of Metro-Atlantic's Greenville, SC office.

Mr Huse has been with Metro-Atlantic since 1952 in various phases of research and development, and Mr Pillsbury, with the firm since 1955, has been engaged in product development.

Robert G Perriello has been appointed vice president and general manager of the Gagliardi Research Corporation, East Greenwich, RI. Mr Perriello will be responsible for the general business management of G R C and its affiliate, the G R C Testing Co, Inc. He will also be responsible for market development and sales planning services for the clients of G R C on new products and processes developed in its laboratories.

Perriello

Rayonier Inc has filled its two top research posts with the appointments of **R Logan Mitchell** as general manager of research for the chemical cellulose producer and subsidiaries, and **George B Creamer** as assistant general manager.

The office of general manager of research has been vacant at Rayonier since the death of Arthur N Parrett in December 1956. The other executive research position is newly created.

Until his new appointment, Dr Mitchell had been research manager at the firm's Eastern Research division, Whippany, NJ; while Dr Creamer was manager of technical service, the company's scientific agency established to assist cellulose-users in the application of Rayonier pulps to their specific needs.

Henry F Dever, vice president of Minneapolis-Honeywell Regulator Company in charge of its industrial products group, has been awarded an honorary doctor of science degree by Bradford Durfee College of Technology, Fall River, Mass.

Dever was cited as a "key industrial executive who has contributed so much to the development of the world's largest manufacturer of controls" and for "unselfish service as an officer of numerous professional and humane societies."

Alexander

George W Alexander has been appointed sales promotion representative for Dow Corning Corp in the New York and Philadelphia areas, where he will be concerned with sales and promotion in the textile and leather fields.

Mr Alexander assumed his duties in New York on June 29. In his new position, he replaces **E S Frasch,** who recently was appointed assistant merchandise manager of Dow Corning's textile and leather industry sales section.

Before joining Dow Corning, Mr Alexander was vice president and general manager of Rittman Publishing Co, Rittman, Ohio.

Howe

Powick

Cunnington

Three new men who have joined the staff of National Milling & Chemical Co, Philadelphia, Pa, during the past year are **Winfield S Howe,** who is serving in the Manufacturing Div; **James Powick,** engaged in the Laboratory Div; and **John Henry Cunnington,** who is serving in the Sales Div.

Bruce Payne & Associates, international management consultants, has announced the appointment of **John R Molden** and **Thomas R Williams** as senior associates.

Mr Molden has spent seven years with the General Electric Co.

Mr Williams is an industrial engineer specialized in time study and methods and standards. Prior to joining BP&A, he was director of methods and standards at Riegal Textile Corp, Greenville, SC, since 1954.

Virginia Smelting Co has announced the appointment of **James P Duffy** to the industrial sales staff. As district representative, Mr Duffy will travel a Mid-South territory with headquarters in Memphis, Tenn.

Just prior to his present appointment, Mr Duffy was division superintendent of quality control for American Finishing Co, Memphis.

Duffy

TECHNICAL LITERATURE

(Literature is available from sources shown in italics)

ACCESSORIES FOR MICROSCOPY CATALOG——*Ernest F Fullam, Inc, Box 444, Schenectady, NY*——This illustrated 28-page catalog lists a complete line of accessories for microscopy. Descriptive material and prices for each item are covered.

BACK COATINGS FOR UPHOLSTERY AND DRAPERY FABRICS; HYCAR 1571 AS A BINDER FOR NONWOVEN FABRICS; and LIMITING PENETRATION OF FABRIC COATINGS WITH CARBOPOL 934——*B F Goodrich Chemical Co, 3135 Euclid Ave, Cleveland 15, Ohio*——Copies of these three new bulletins as well as an index to additional textile chemical literature may be secured by writing to BFG Chemical.

Previously issued bulletins cover various aspects of nonwoven fabric manufacture with emphasis upon binder selection, compounding, and performance characteristics. Other bulletins discuss carpet and rug backings, a description of the various textile chemicals marketed by BFG Chemical, and a summary of related information concerning specific products.

Textile chemical products of B F Goodrich Chemical Co include Geon polyvinyl chloride resins and latices and polyvinyl acetate latex, Hycar acrylic and nitrile latices, and Good-rite Carbopol hydrophilic polymers.

BUTYNEDIOL —— *Antara Chemicals, General Aniline & Film Corp, 435 Hudson St, New York 14, NY*——This 40-page booklet presents the physical and chemical properties of butynediol and discusses its industrial applications. Information is also given on storage and handling of the chemical.

Butynediol ($HOCH_2C{\equiv}CCH_2OH$) is a new intermediate which is prepared by a high-pressure acetylene process. It reacts as a glycol and as a disubstituted acetylene; forms cyclic compounds by trimerization, dimerization, and esterification. It may be used as an intermediate for textile auxiliaries.

COMPARATIVE LIGHT-EXPOSURE TESTS WITH NATURAL DAYLIGHT AND THESE TESTERS: XENOTEST PL393, FUGITOMETER, CPA FADING LAMP, AND FADE-OMETER——*G F Bush Associates, Box 175, Princeton, NJ*——This literature is a translation of an article which appeared in German in *Melliand Textilberichte* of November 1957.

COMPENDIUM OF WATER POLLUTION LAWS——*Manufacturing Chemists' Association, Inc, 1825 Connecticut Ave, NW, Washington 9, DC; $5.00*——Manual W-5 is a compendium of state and federal water-pollution-abatement laws of the United States.

The fifty-three chapters of the compendium cover the laws of the fifty states, federal laws and those of the District of Columbia and Puerto Rico pertaining to water pollution.

One chapter is devoted to each state or jurisdiction. It describes the organization of the water-pollution-control commission or agency and gives its address; describes the commission's water-pollution-abatement policy, gives a resumé of the law and briefly outlines the rules and regulations in force.

Credit for preparation of the book published by MCA's Water Pollution Abatement Committee is given to Carl E Geuther, of the Legal Department, E I duPont de Nemours & Co, Inc.

In the preface Mr Geuther points out that the purpose of the compilation is to provide a handbook for reasonably easy reference. It is planned to keep the work up to date by the issuance of biannual supplements which correspond generally to state legislative sessions.

DICYCLOPENTADIENE DIOXIDE, LIMONENE DIOXIDE——*Chemicals & Plastics Div, Food Machinery and Chemical Corp, 161 E 42nd St, New York 17, NY*——Two revised and expanded technical bulletins on epoxides.

Technical Bulletin No. 95 (3 pages) describes dicyclopentadiene dioxide now available in development quantities from FMC. Dicyclopentadiene dioxide is a difunctional epoxide that can be used both as a modifier of conventional epoxy resins and as a primary building block for an epoxy resin system. Uses of this reactive diepoxide in alkyd resins, and as an intermediate for producing protective coatings and surface-active agents are listed.

Technical Bulletin No. 96 (4 pages) describes limonene dioxide, a material combining the reactivities of an internal and an external epoxy group in the same material. FMC offers limonene dioxide in development quantities, and indicates its use as an efficient reactive diluent for epoxy resins and also as a primary building block for an epoxy resin system. Applications in alkyd resins and chemical intermediates as well as chemical reactions also are outlined.

ELECTRIC TYPEWRITER FOR TYPING OF CHEMISTRY SYMBOLS AND FORMULAS —— *#659-228-54.1, Remington Rand, 315 Fourth Ave, New York 10, NY*——A method of using an electric typewriter for quick, convenient typing of special symbols and formulas needed in the field of chemistry is the subject of this new booklet.

It is the second in a series designed to show how different fields in business and industry can make profitable use of interchangeable typewriter type, the first publication in the series having dealt with the field of electronics and electricity.

This method is said to insure clean, neat type for ordinary purposes, and for specialized requirements as well. In the case of chemistry, for example, many complex chemical symbols, equations, and formulas are needed, the characters for which reportedly do not exist on presently available typewriters in such convenient form. They have to be tediously handwritten, or special type bars installed. Both methods are time-consuming and expensive.

With interchangeable type heads, the typist can insert special type characters in a matter of seconds, it is claimed. There is said to be no need for an extensive knowledge of typewriter parts or for relearning the keyboard. Only the type face is changed. It snaps into place in one operation and is locked or removed with magnetized tweezers.

Printwork is said to be always consistent, producing an impressive, finished look, and a wide range of typewriter ribbons can be used with this type.

EMULPHOGENE BC NONIONIC SURFACTANTS——*Antara Chemicals, General Aniline & Film Corp, 435 Hudson St, New York 14, NY*——The Emulphogene BC family of nonionic surfactants are described and their properties discussed. Chemically, these surfactants are alkylpoly-(ethyleneoxy) ethanols with various ethylene oxide content. They are said to offer a wide range of commercially useful properties that include wetting, detergency, emulsification, dispersion, solubility, and foaming, which may be used to advantage by the textile industry.

ETHOXYLATED CHEMICALS——*Armour Chemical Div., 1355 W 31st St, Chicago 9, Ill*——This newly revised booklet on ethoxylated chemicals covers their chemical properties and widespread potential application.

The ethoxylated chemicals are made by combining ethylene oxide with fatty amines, amides or acids to form cationic or nonionic surface-active agents.

The booklet covers the chemical structure of the Armour trademarked Ethomeen, Ethoduomeen, Ethofat and Ethomid products, gives their physical properties and emulsification characteristics.

Industrial applications of the ethoxylated chemicals include textile agents.

EVALUATION OF FUNGICIDAL VINYL-COATED COTTON DUCK——*Order PB 151464 from OTS, U S Dept of Commerce, Washington 25, DC*——This 58-page Air Force report (reported on for the Wright Air Development Center) concerns the usefulness of 8-oz, fungicidal, vinyl-coated cotton duck fabrics in military applications and military stockpiling. It was prepared by Jacob K Frederick Jr, R E Otto, and David H Pfister of the Lowell Technological Institute Research Foundation.

Numerous physical and chemical tests were made on the fabrics, including breaking and tearing strengths, low temperature flexibility, high temperature

blocking, resistance to gasoline, resistance to hydrostatic pressure, resistance to weathering, and color change. Storage and outdoor exposure tests of four-, six-, ten-, and 12-month periods followed by soil burial for two weeks were included. With some fabrics, a stabilizer designed to prevent light deterioration was used.

Test sites from Alaska to Florida were involved in the evaluations, the results of which are significant in the critical problem of materials stockpiling. The fabrics, fungicides, and the evaluation methods and results are described. The report also contains information and supporting data on selected measurable characteristics on which standards of acceptability can be determined.

FRANCOLOR LITERATURE——*Francolor Inc, 148 Hamlet Ave, Woonsocket, RI*——Several new technical leaflets on various colors handled by Francolor Inc, a division of Compagnie Francaise des Matieres Colorantes of Paris, France, are now available on request. Each leaflet contains information as to class, uses, characteristics, printing or dyeing methods, fastness and application data, as well as samples.

No. 234-E covers Solanthrene Beige N Paste Optima, a vat color for printing on cotton or other vegetable or regenerated fibers. It may be employed on acetate rayon in the case of machine prints in pale shades. This color is particularly recommended by Francolor for printing on filament or spun viscose, especially for large blotches in pale shades. It's stated that very uniform prints are obtained, which have excellent fastness to light, even in pale depths.

No. 235-E covers Printing Matt White N, a pigmented emulsion for direct printing of white or colored matt effects and half tones on cellulosic, animal or synthetic fibers. It reportedly may also be used to increase the purity of white discharges.

No. 247-E covers Naphtazol 4J for the dyeing of cotton and viscose rayon.

No. 263-E covers Solanthrene Brilliant Scarlet N Paste Optima, a vat color for printing of cotton and other vegetable or regenerated fibers. It may be used on acetate rayon in the case of pale shades, printed by machine. Printed on cotton, filament and spun viscose rayon, this color is particularly recommended by Francolor for red and scarlet shades of outstanding brightness and fastness to hot pressing (no sublimation at 200°C).

No. 281-E covers Diazol Light Red 3B, a direct color for the dyeing of cotton and viscose rayon.

No. 295-E covers Neutrogene Brilliant Red B, an insoluble azoic color which is fixed on the fiber by neutral steaming. It is used for direct printing on cotton and viscose fabrics.

GENERAL ELECTRIC SILICONE PRODUCTS —— *Silicone Products Dept, General Electric Co, Waterford, NY* —— This new, eight-page catalog highlights the major General Electric silicone products and their uses.

Among the important silicone uses described are: water repellents, textile finishes, and release and antifoam agents.

Designated as CDS-129A, this illustrated publication lists additional specialized literature covering product and application information as well as major G-E silicone products.

MANUAL OF TEXTILE DEFECTS AND IMPERFECTIONS; STANDARD PROCEDURE OF QUALITY EVALUATION FOR WOVEN TEXTILES——*National Association of Shirt, Pajama & Sportswear Mfrs, 10 East 40th St, New York 16, NY*——The Manual is offered as a rule and guide between vendor and vendee to define defects in woven textiles and to establish penalty point values for them. It also provides a formula whereby vendor and vendee can agree on the quality level of the purchase, within which delivery must be made.

The Manual was two years in the making.

PROPERTIES AND USES OF ALKYL AND ALKYLENE AMINES——*Union Carbide Chemicals Co, Division of Union Carbide Corp, 30 East 42nd St, New York, 17, NY*——This booklet contains comprehensive data for 19 amines, including physical properties, tables and charts, end-use possibilities, shipping data, constant boiling mixtures, specifications, and test methods, physiological properties, and storage and handling methods. A detailed bibliography and reference section is included.

The alkyl amines are intermediates for, among other things, specialty soaps, dyestuffs and textile specialties.

The alkylene amines are intermediates for "wash and wear" textile finishing resins, fungicides, emulsion breakers, polyamides, chelating agents, epoxy resin curing agents, etc.

RCI PHTHALIC ANHYDRIDE——*Reichhold Chemicals, Inc, White Plains, NY*——This 8-page, illustrated brochure discusses the applications of phthalic anydride, including dye intermediate manufacture; specifications, properties, and packaging and shipping information for the flake and liquid forms. Also included is a section on handling of molten and flake phthalic anhydride, as well as a listing of RCI plants and warehouses handling the product.

SINGLE BOWL INTERMITTENT CRABBING MACHINE——*Birch Bros, Inc, 32 Kent St, Somerville 43, Mass*——Circular BB931 illustrates this multipurpose machine and gives details of features included and construction.

The machine is primarily designed for crabbing fabric by the individual piece, but it is said to be equally capable of performing wet decating and steam blowing operations.

STABILIZING DISSOLVED IRON IN PROCESS WATER——*Milton Roy Co, 1300 E Mermaid Lane, Philadelphia 18, Pa*——Application Engineering Data Sheet No. J-58-2 describes a chemical feed system for a sequestant to process water. Specifically the data sheet describes the equipment used by American & Efird Mills, Mt Holly, SC, to meter Calgon TG to prevent iron stains and to keep dissolved iron from destroying the brightness of dyes.

The automatic feeding equipment was installed to utilize existing positive-displacement-type flow meters. Complete details are given in the data sheet including a list of required equipment specifications.

STANDARDIZATION — WHAT'S IN IT FOR ME?——*American Standards Association, Dept PR 65, 70 East 45th St, New York 17, NY; $4.50*——How the textile producer and the consumer both benefit from standardization is the subject of the several papers in this 128-page, illustrated booklet. Seven papers present as many viewpoints on the growing use of American Standard L22, Minimum Requirements for Rayon and Acetate Fabrics. Represented are the yarn producer, dyer and finisher, garment maker, sales, merchandising, consumer and the home economist.

It is the printed proceedings of the Ninth National Conference on Standards held in New York, November 18-20, 1958, under the auspices of the American Standards Association, sponsor of the annual conference.

In all, fifty papers on the practical and financial benefits from standardization are offered. They are the work of authorities from industry, science, government, and they describe the important part standards play in our industrial economy. The experts tell why more standards are urgently needed to simplify and cut costs in purchasing, design and engineering.

Executives tell how they have put standards to work for profits in their fields—nuclear power, electronics, steel, chemicals, petroleum, photography, telephone, electrical, plastics, in addition to textiles.

TEXTILE DRYING EQUIPMENT——*Andrews & Goodrich, Div of Midland-Ross Corp, 336 Adams St, Boston 22, Mass*——This brief descriptive bulletin covers two recently developed laboratory-size units: the Continuous Resin-Curing Oven and the Patch Drying Oven. Either unit can be modified in design to meet individual requirements.

TWITCHELL 7440 LUBRICANT——*Emery Industries, Inc, Dept 5, Carew Tower, Cincinnati 2, Ohio*——Technical bulletin 414 discusses Twitchell 7440, a new, water-soluble, antistatic fiber lubricant.

Formerly designated as Emery 3198-S in development stages, Twitchell 7440 Lubricant reportedly provides an unusually high degree of static control and effective lubrication for all natural and synthetic fibers. It was recently approved by the Wool Associates of the New York Cotton Exchange, Inc for wool tops.

The bulletin contains data on static control, scourability, resistance to yellowing, and light and storage stability. Recommended usage encompasses all fibers and processes where static control is advantageous, including all natural fibers and the synthetics represented by nylons, polyesters and acrylics.

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